



Windows 8 Mobile Broadband

What Mobile Operators Need to Know
About Windows 8 Connectivity

Part 1: Windows 8 Mobile Broadband API Extensions

Enhancing Windows 8 Connectivity

Mobile network operators and end users will see improvements to broadband connectivity in Windows 8, such as automatic device detection and installation. However, many features will still require development and integration in order to create a rich, seamless user experience. For example, billing alerts and diagnostics are common connectivity needs of end users and operators, but are not delivered as turnkey features of Windows 8.

This white paper is the first in a series that will address how operators can leverage the unique Smith Micro approach to enhance Windows 8 connectivity and engage users, while lowering operational costs with a standards-based design. In this white paper, we examine new Windows 8 features related to broadband connectivity, including the built-in connection interface, mobile broadband class driver, and Mobile Broadband Application Programming Interface (MBAPI) extensions that are critical to meeting the needs of operators and end users. Subsequent white papers will cover connectivity

standards of the new Mobile Broadband Interface Model (MBIM) in detail, and discuss the opportunity of bringing broadband mobility to Wi-Fi-only Win 8 devices.

Windows 8 Connection Manager Tiles

The first and most noticeable change to Windows 8 is the addition of a new Xbox-style user interface (UI) design (fig. 1). Similar to the Windows Phone operating system, the new Win 8 home screen will display applications in the form of tiles. Mobile broadband connection management will also be accessed through a Win 8 tile application, allowing operators to extend their brand onto Windows devices. Microsoft is providing standardized style guides and tile sizes to give the Win 8 UI a consistent look. To access network or mobile broadband device information, a user can tap on the operator's tile to gain access to a connection manager application (fig. 2).

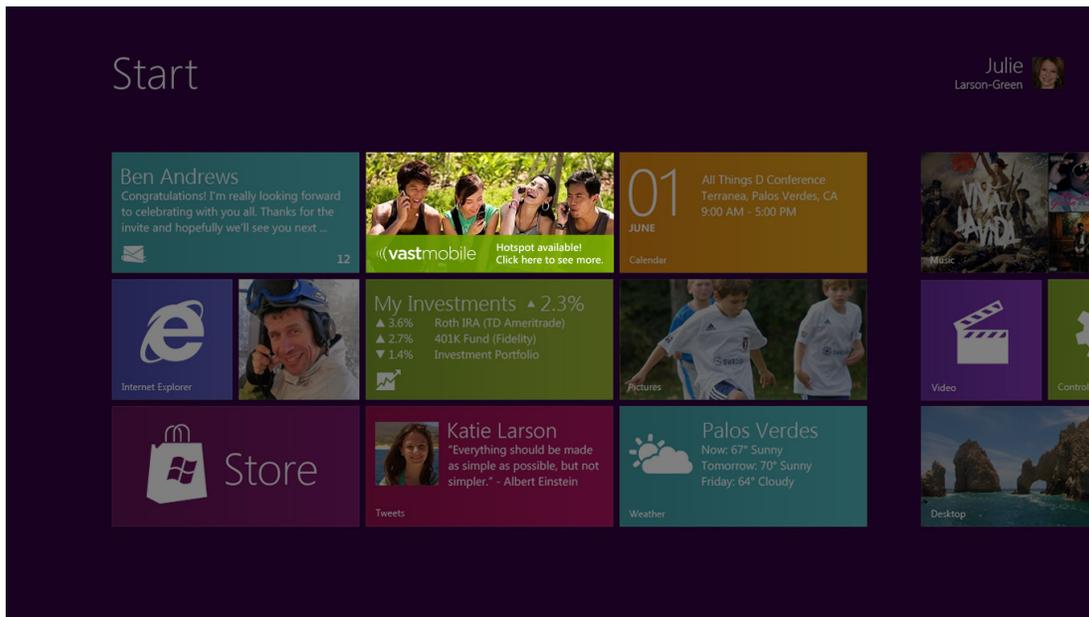


Figure 1
Windows 8 Home Screen With Mobile Broadband Tile

Once their tile is tapped, **operators have access to more real estate to promote their brand and premium services**, such as video on demand, hotspot applications, and visual voicemail. Operators can also lower operational costs by giving users access to advanced features, such as connection diagnostics and plan information with billing alerts, which can significantly reduce the

volume of customer care calls. Supporting Windows 8 broadband devices will require the development of operator-specific Win 8 Tiles through a certified Microsoft vendor. Without additional development of the tile and connection management application, users will view only basic network and device information from the Windows 8 networking UI (fig. 3).

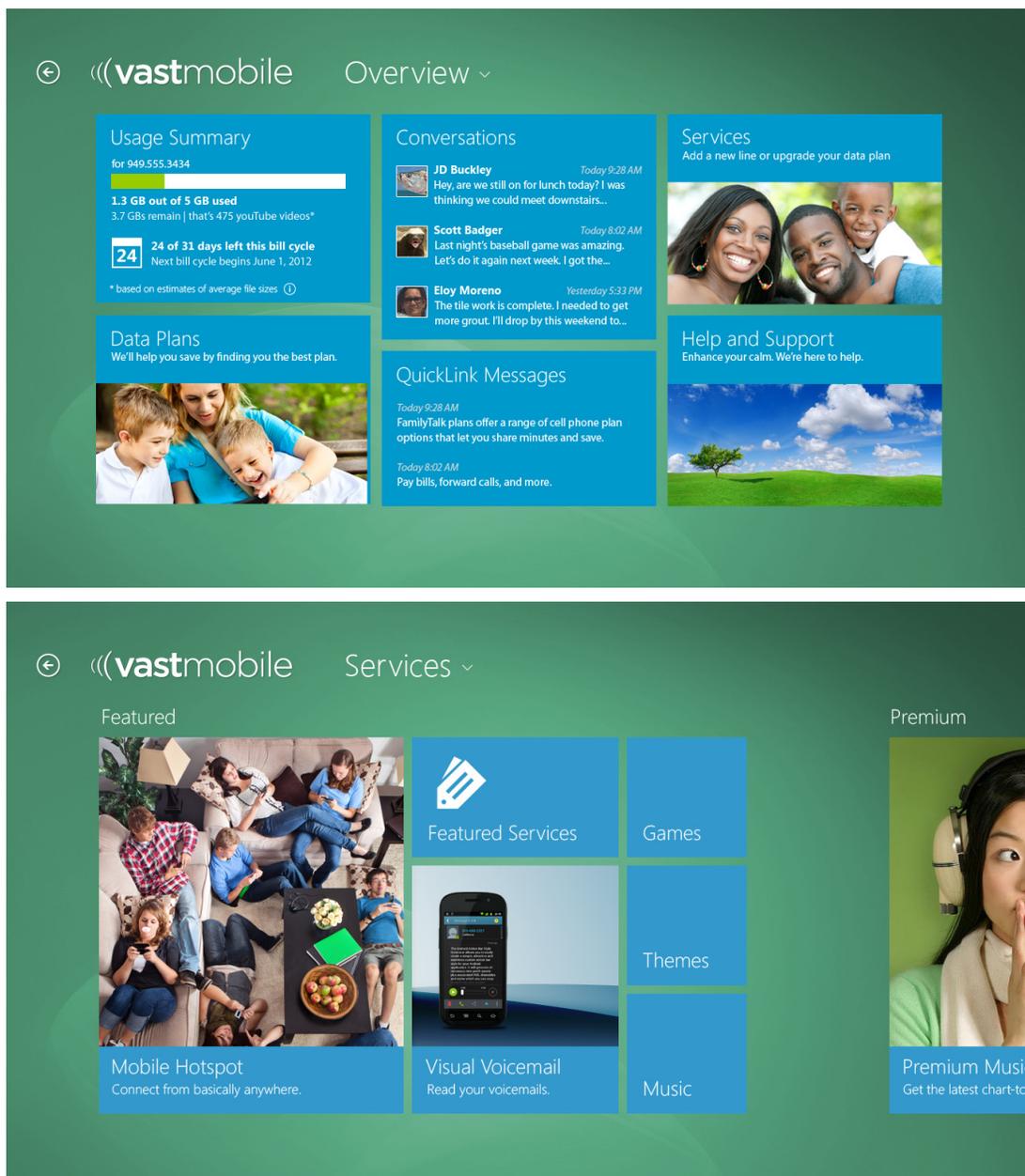


Figure 2
Example of an Operator's Mobile Broadband Windows 8 Application

Windows 8 Device Drivers and APIs

Another big change for Windows 8 connectivity is the mobile broadband class driver. This eliminates the need for OEMs to write device drivers and have them certified by Microsoft (fig. 4). The new common mobile broadband class driver can support devices from multiple OEMs and operators out of the box, and can be updated via Windows updates. Prior to Windows 8, management of mobile broadband device functions, such as turning radios on/off and configuring connection settings, was performed in the individual management application for each device. Now Windows 8 provides a simple and fully integrated radio and connection management console.

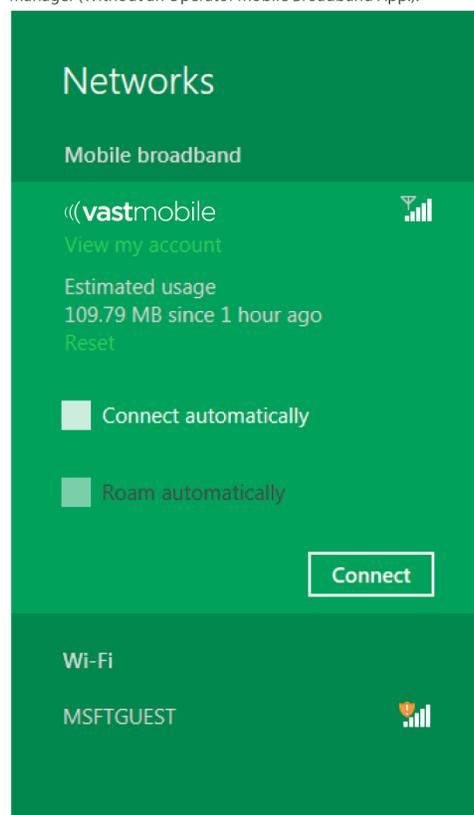
Also, Windows 8 will include support for branding and some customizations for the mobile broadband experience. However, the Windows 8 MBAPI is largely the same as that of Windows 7. The difference is that Microsoft created an extension mechanism for Windows 8 to add features that aren't supported in the Windows 8 Runtime API. Windows 8, like Windows 7, does not encompass every connection management feature needed by every carrier in the

world, but it provides a better framework to create richer connectivity apps. **As a rule of thumb, if the operator feature wasn't supported in Windows 7, it will likely need to be designed as an extension to Windows 8.**

A few advanced features that would require extensions include diagnostics, location-based services such as GPS, Unstructured Supplementary Service Data (USSD), and enhanced roaming capabilities. Also, operators looking to view connectivity-related performance metrics will need to develop extensions to log this data, as it is not part of the common API. These advanced features are important to mobile operators in order to differentiate their services from their competitors' services, and ensure a great customer experience.

Lastly, as in Windows 7, there are gaps in Windows 8 CDMA features, such as service activation. Windows 8 supports activation via a SIM, which is only for GSM/LTE networks. For any carrier using CDMA for activation, additional development may still exist.

Figure 3
Mobile Broadband Connection as Shown Through the Windows Connection Manager (Without an Operator Mobile Broadband App.).



Operators on the CDMA network may need additional extension APIs or custom SDKs from device manufacturers in order to continue features that currently exist in the operator's device portfolio.

Windows 8 Wi-Fi and Networking

As the use of data-enabled mobile devices increases, network traffic congestion is driving operators to take advantage of Wi-Fi networks to augment their cellular networks. Fortunately, there are improvements in Windows 8 to support this trend.

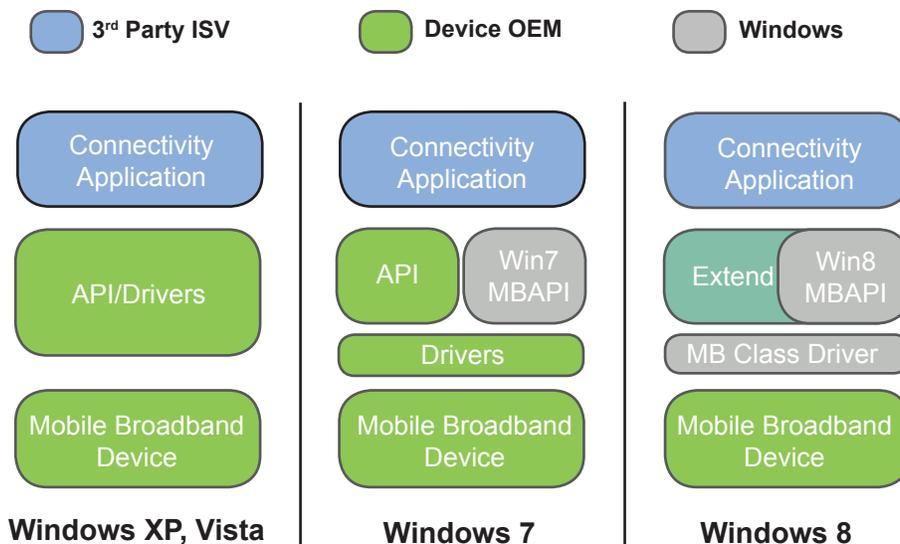
Windows 8 users can download and save trusted Wi-Fi hotspot information from the cloud to their devices, enabling them to automatically connect to those hotspots when in range. New APIs label connections as either metered (data usage is tracked) or non-metered; Windows 8 creates a prioritized list of network connections and automatically connects users to non-metered Wi-Fi connections when available. It is important to note that Windows 8 is enabling the preference to connect to a Wi-Fi network over a chargeable, metered WWAN network. Operators that want more control over Wi-Fi offload and network routing will need to invest in an intelligent policy driven solution.*

For mobile hotspot devices, Windows 8 will default the user to an unmetered connection. This means if a user is connecting to the internet through a mobile hotspot puck or tethered smartphone, data usage is not being tracked, although the user may be paying for mobile broadband data when connected in this way. Without additional CM development to support the unique characteristics of mobile hotspot devices, **operators risk seeing an increase in support calls from frustrated users complaining about their unexpected data charges.** By incorporating an advanced notification system in their Windows 8 connection manager, operators can take action against "bill shock" by proactively alerting the user when they are using a chargeable connection and are approaching their data limit.

*To learn more about the intelligent data offload solution from Smith Micro, visit smithmicro.com/netwise-director

Figure 4
The Evolution of Mobile Broadband in Windows

Windows Mobile Broadband Software Stack



Windows 8 MBIM Industry Standard

Industry standards for mobile broadband connectivity are emerging, including the Mobile Broadband Interface Model (MBIM) published by the USB Implementers Forum. As a contributor to the MBIM specification, Smith Micro joined Microsoft and other industry leaders to design connectivity specifications that enable flexible, efficient, and lower-cost device implementations for desktops, laptops, tablets, and mobile devices. While Windows 8 will be the first operating system to use MBIM, the new standard will support other popular PC and mobile operating systems as well. In Part 2 of this Windows 8 Mobile Broadband white paper series, we will describe how MBIM extensions can help operators leverage new features of Windows 8 on multiple platforms, while managing backward and forward compatibility.

Smith Micro Solutions for Windows 8

QuickLink® MiTile is the only connectivity product to default mobile hotspots to a metered connection—reducing “bill shock.” Designed to support Microsoft’s Windows 8 Tile User Interface, QuickLink MiTile provides mobile operators with enhanced connectivity features, including usage metering and billing redirect, roaming indicator, byte counters and other status indicators, and an operator-branded user experience. By utilizing QuickLink MiTile, operators can provide the optimal connection manager for Windows 8, while ensuring functional consistency and backward/forward compatibility across user interfaces and OS versions.

QuickLink® Zero provides a mobile connection manager for USB modems and mobile hotspots, without the need for driver installation. By integrating QuickLink Zero with QuickLink MiTile, mobile operators can provide advanced diagnostics to keep users online and integrate billing systems, making it easy for users to purchase premium services. With a browser-based landing page, operators create consistency across operating systems and device platforms to lower training and support costs.

QuickLink® Hotspot extends mobile operator content and services to billions of Wi-Fi only devices, and helps operators encourage hotspot service adoption with integration into backend billing systems. QuickLink Hotspot includes proactive billing notifications, enhanced user management, diagnostics, and a captive portal to accommodate day pass users and promote premium services.

About Smith Micro

Smith Micro provides solutions that simplify, secure, and enhance the mobile experience. Our wireless portfolio spans Connectivity, Policy Management, Network Control, Communications, and Hosting solutions. With 30 years of experience developing world-class client and server software applications, Smith Micro helps leading mobile network operators, device manufacturers, and enterprises increase efficiency and develop high-value relationships with their customers.

To learn more about how Smith Micro is enhancing Windows 8, visit smithmicro.com/quicklink-mitile