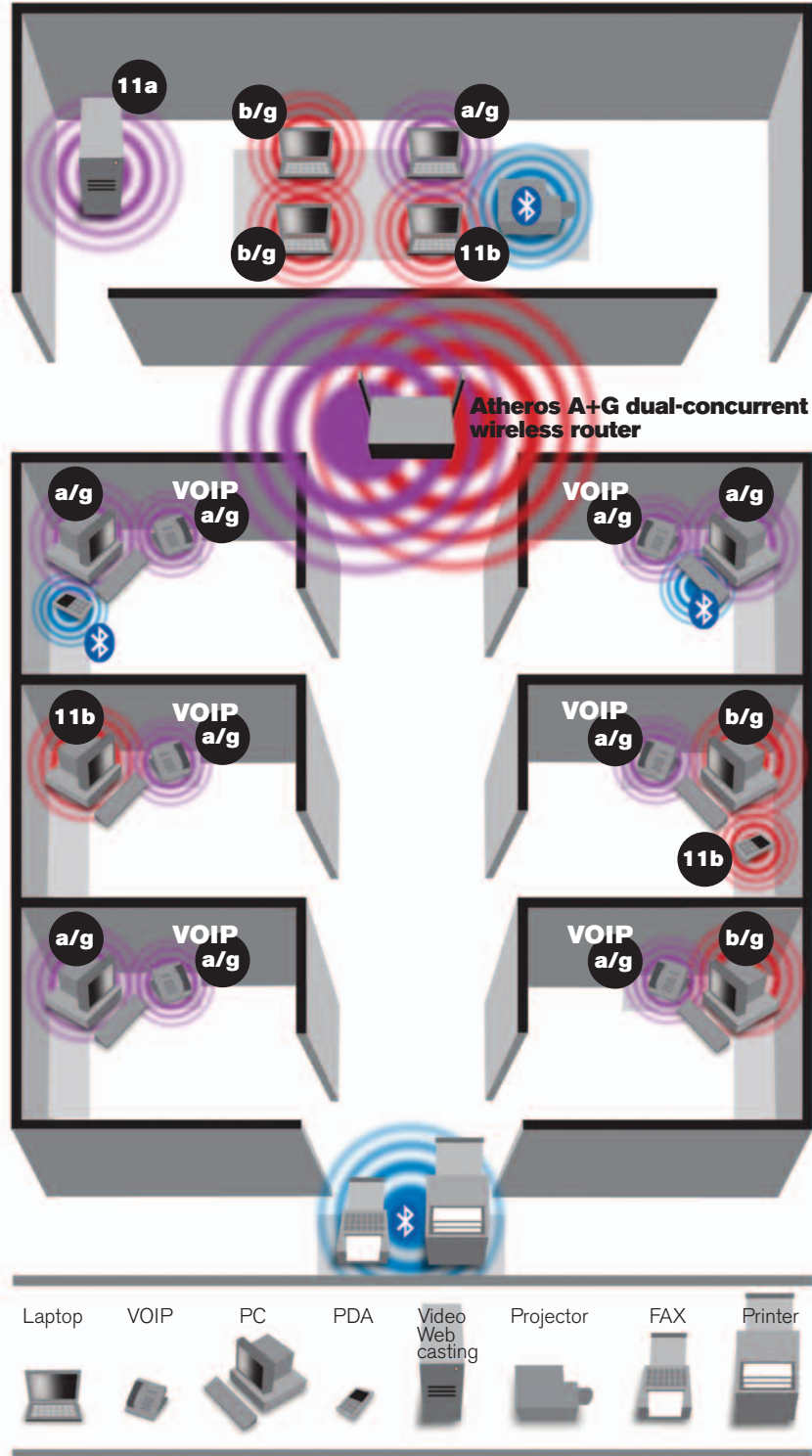


Dual-band task delegation for the enterprise just makes sense.
 .11a for high priority traffic. .11g for lower priority data.



529 Almanor Avenue
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Data networking. Multimedia. VoIP.

27 channels, no wires, no gridlock.

No interference, no compromise.

Just broad capacity.

The solution is clear: Atheros AG.



802.11 a/g: The clear solution for maximizing WLAN bandwidth

WLAN bandwidth demands created by growing numbers of users and devices on networks, and new multimedia and VoIP applications are increasing daily. While 802.11g networks have previously satisfied most best-effort data traffic, new multimedia and VoIP applications require clear, uninterrupted bandwidth to deliver latency-free transmissions expected by users in enterprise as well as home environments.

The 802.11a band boldly meets these new requirements with broad, 24-channel capacity that is free from the interference created on b/g wireless networks by other nearby WLANs and devices. When combined with 3-channel 802.11g, the .11a band creates capacity to generate a wire-like end-user experience. The .11a band can efficiently serve high-priority traffic, leaving .11g to provide lower-priority data service.



Market Segment Drivers

Enterprise

Enterprise WLANs face the challenges of growing numbers of users on wireless networks and increasing use of wireless bandwidth for large-scale backups and large media file transfers requiring wire-like speeds. Growing enterprise applications such as VoIP and video webcasting are much less forgiving of collisions with data traffic and other network interference. And, the increasing number of enterprise PCs offering AG capabilities so critical to the mobile professional requires the universal, future-proof connectivity of AG networks in the enterprise. It is clear that the flexibility and bandwidth offered by dual-band networks is the only choice for enterprise networks.

Home and SOHO

Bandwidth capabilities are increasing rapidly for personal WLANs with the introduction of new devices and value-added services via cable broadband infrastructures delivering throughput up to 30 Mbps to the home. High definition video, MPEG streams, and data channels can easily exceed the 22 Mbps throughput that a single-channel 802.11g network can provide. Plus, WLANs are being burdened by more network devices, neighboring networks and home devices that also use the 2.4 GHz band, like microwave ovens, baby monitors and cordless phones which mean high demand and increased interference that can undermine applications like Video and VoIP.

Hot Spots

As is inevitable with so convenient a phenomenon, adoption rates for mobile travelers, workers, and gamers is increasing. And, as users get more comfortable creating their network on the road, demands on hotspot networks are growing rapidly.

The 802.11b/g dilemma: 2.4 GHz gridlock.

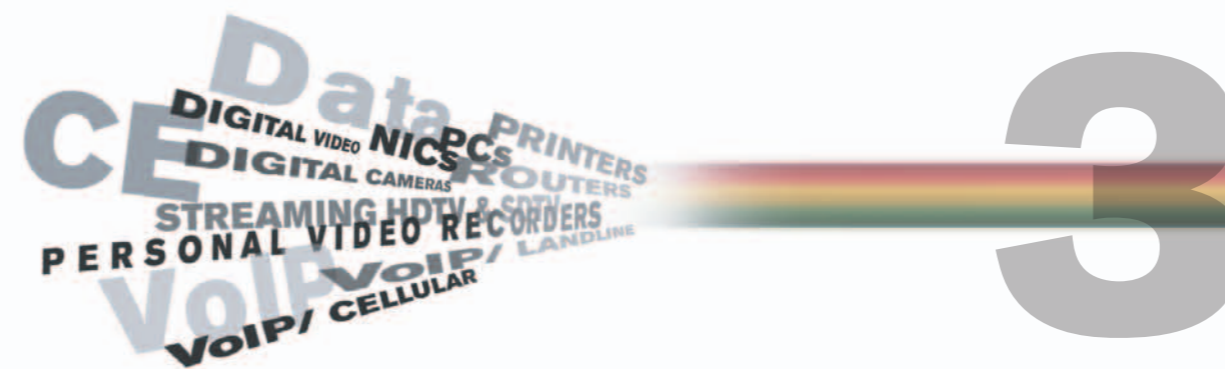
Limited capacity and High Interference

It is a simple fact: on a 2.4 GHz network, there are only 3 non-overlapping channels. As a result, multiple 802.11g networks interfere with each other and the presence of 802.11b devices in the 2.4 GHz band even further decreases available bandwidth. 802.11b traffic receives priority on a network, preceding .11g transmissions and reduces the overall network throughput. These factors result in generally inadequate throughput to support multiple data devices, and are certainly insufficient for more demanding applications such as VoIP and video webcasting. To compound problems in the enterprise, Bluetooth devices frequency-hop across the 2.4 GHz band to create interference on 802.11b/g networks. And in the home, non-WLAN devices operating on the 2.4 GHz band can literally stop WLAN transmissions on the network.

High User Expectations

When you put these factors together: increasing numbers of users and devices to support on the Enterprise network, the quickly growing adoption of VoIP and webcasting, high bandwidth consumer electronics in the home, increasing user expectations, and a universe of interference on the 2.4 GHz band, is it any wonder these three channels are under siege? And yet, VoIP and multimedia require uninterrupted delivery, with latency-free, no-jitters streaming. Users in the enterprise or at home will not accept breaks in transmission, and a positive brand perception relies fundamentally on a positive user experience... the importance of bandwidth availability cannot be overstated in today's market.

3 channels



If you could increase your network capacity by 800% at little or no increase in cost to avoid WLAN gridlock, wouldn't you?

The dual bandwidth solution: 802.11 a/g dramatically widens the highway.

Enter 802.11 a/g. With 24 non-overlapping channels on the 5 GHz band vs. 3 channels on 2.4 GHz, .11a/g is a high-bandwidth, low-cost solution for today's enterprise and home applications that is ready and proven. And because it is dual band, 3-channel .11b/g can be used for data traffic and it's less stringent requirements, while 24-channel .11a can be leveraged for high priority video and VoIP traffic needing high bandwidth, lag-free streaming. 802.11a is the clear choice for networks serving multiple devices and users with high-demand needs. And because .11a runs on the 5 GHz band, it avoids interference problems inherent in the popular and increasingly crowded 2.4 GHz frequency. In fact, 20 of the 24 channels in the 5 GHz band are reserved for broadband protocol and only 4 of them are open to broadband plus other devices. This insures clear spectrum and is far more advantageous than the 2.4 GHz band where the 3 available channels are open to all devices, thereby assuring interference.

27 channels



Attribute	802.11a	802.11b/g
Spectral Diversity Capability	<ul style="list-style-type: none"> 24 non-overlapping channels maximize network capacity and allow segregation of multiple types of traffic 	<ul style="list-style-type: none"> 3 non-overlapping channels invite co-channel interference problems
Aggregate Available Bandwidth (standard mode)	<ul style="list-style-type: none"> 24 x 54 Mbps = 1,296 Mbps Actual throughput on each channel ~22 Mbps 	<ul style="list-style-type: none"> 3 x 54 Mbps = 162 Mbps Actual throughput on each channel with no 802.11b devices is ~22 Mbps, but reduced to ~14 Mbps when .11b devices present
In-band "Noise"	<ul style="list-style-type: none"> 20 channels reserved for broadband protocol only; 4 channels available to WLAN and non-WLAN devices Some cordless phones transmit at 5 GHz in one direction High signal-to-noise ratio 	<ul style="list-style-type: none"> 0 channels reserved for broadband protocol only; 3 channels available to many devices Other nearby WLAN Multiple devices such as Bluetooth, microwaves, cordless phones, baby monitors Low signal-to-noise ratio
Ubiquity	<ul style="list-style-type: none"> Mainly in enterprise access points, VoIP handsets, and emerging multimedia devices 	<ul style="list-style-type: none"> Homes, enterprise, hotspots, pe integration, data traffic and audio clients

“ Wireless base stations and access points must operate with dual-bands, using the 802.11a and 802.11g protocols, and must support both bands simultaneously. The base stations and access point must support both 2.4GHz and 5 GHz clients simultaneously.”

—Microsoft's Guidelines for Home Networking Components to Support Audio and Video Streaming –WinHEC 2004 –April 19, 2004

The Atheros AG Solution

- Atheros is the undisputed leader of a-band technologies, having more than 6 successful years of market proven solutions.
- Atheros offers the only dual-concurrent solution on the market today.
- Atheros has created the first single-chip implementation for the AG client, offering maximum performance with the greatest cost efficiency.
- Atheros' Super AG technology provides all the benefits of both bands at maximum speeds, 108 raw data rates, more than 60 Mbps throughput
- Atheros is offering a full array of dual-band 802.11n technologies, beginning with VLocity MIMO, our latest dual-band, pre-11n technology that delivers the highest throughput levels at range.

For more information on how Atheros AG solutions can solve your end-users networking problems, contact Sales or Marketing at Atheros, 408-773-5200.

