

# 1 Augmented Reality

## New Popular Resource

AUGMENTED REALITY (AR) IS A TERM THAT is becoming increasingly popular with recent developments in technology – advanced low power chips and new operating systems in mobile devices, built-in GPS and high-speed communications. The term is believed to have been first used by Thomas Caudell from Boeing in 1990. The augmentation of reality is achieved by superimposing different types of information on a live direct or indirect view of a physical real-world environment, thus creating a mixed reality. Many different industries are working on different AR applications to help people in achieving their tasks in a more efficient way.

One example of an AR application is the developed by BMW set of tools for support of automotive technicians in performing repair work. Using augmented reality, the mechanic receives additional three-dimensional information to help him in diagnosing the fault. He sees virtually animated components, the tools to be used, and hears instruction on each of the working steps through headphones integrated inside the goggles. The BMW Augmented Reality guides the mechanic through the entire repair procedure. Growing demand and increasing technical complexity are thus met with a constantly high level of service based on maximum expertise and cutting-edge technology. A short video describing the process can be seen at [http://www.bmw.com/com/en/owners/service/augmented\\_reality\\_introduction\\_1.html](http://www.bmw.com/com/en/owners/service/augmented_reality_introduction_1.html)

Many new content layers such as Wikipedia and Twitter are available in the Reality Browser as well as tourist, nature and cultural guides.



Specialized applications like these can be very useful for repair of different primary or secondary equipment in substations. While it may take some time to see AR applications in the world of PAC, you can already experience some using your smart phone thanks to Layar – an augmented reality browser that displays real time digital information on top of reality seen through the camera of your mobile phone.

In Layar what is web pages in normal browsers are replaced by Content Layers. A layer is the digital view that is added to the camera view. Layar enables content partners to offer Augmented Reality experiences. It offers an easy interface to discover and use Augmented Reality services. Layar was first launched in June 2009 in The Netherlands and its second generation Reality Browser is now available globally from SPRXmobile on mobile devices with the Android operating system. The operating system allows the use of the mobile phone camera as the source of the reality view on which the content from the layer is superimposed. The built-in GPS provides to the browser the location of the user, while the built-in digital compass delivers the direction at which the user is pointing that is used to provide the information available for the subject of interest from the selected content layer. It will be interesting to see what Layar and other augmented reality applications may become available in our field in the future. ■

For more information visit: <http://www.layar.com>



Examples of augmented reality applications from Layar and BMW

## 2 The Google Chrome OS – rethinking what an operating system should be

Nine months after the launch of the Google Chrome browser, the company announced a new project as its natural extension - the Google Chrome Operating System. It is an attempt to rethink what operating systems should be. The main reason behind this effort is the fact that the operating systems that browsers run on were designed in an era where there was no web. So Google Chrome OS is announced as an open source, lightweight operating system that will initially be targeted to netbooks. Later this year Google will open-source its code, and netbooks

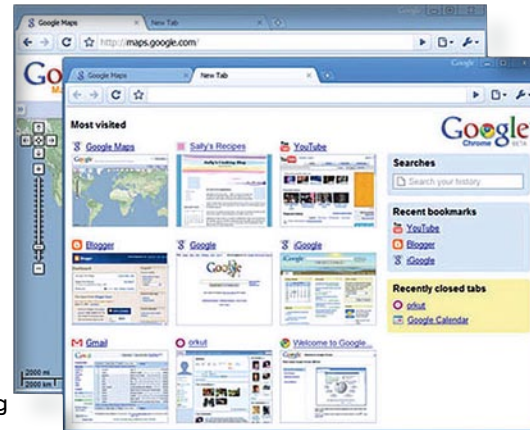
running Google Chrome OS are expected to be available for consumers in the second half of 2010. The vision is to develop a fast and lightweight operating system characterized by speed, simplicity and security, that will allow the user to start up and get onto the web in a few seconds. Since most of the user experience takes place on the web, the user interface is intended to be minimal to stay out of your way. The development team is going back to the basics and completely redesigning the underlying security architecture of the OS so that users do not have to

deal with viruses, malware and security updates. Google Chrome OS will run on both x86 as well as ARM chips and Google is working with multiple OEMs to bring a number of netbooks to market next year.

The software architecture is simple — Google Chrome running within a new windowing system on top of a Linux kernel. Google Chrome OS is a new project, separate from Android. Android was designed from the beginning to work across a variety of devices - from phones to set-top boxes, to netbooks. Google Chrome OS is being created for people who spend most of their time on the web, and is being designed to power computers ranging from small netbooks to full-size desktop systems. While there are areas where Google Chrome OS and Android overlap, we believe choice will drive innovation for the benefit of everyone, including Google. The developers hope to meet the requirements

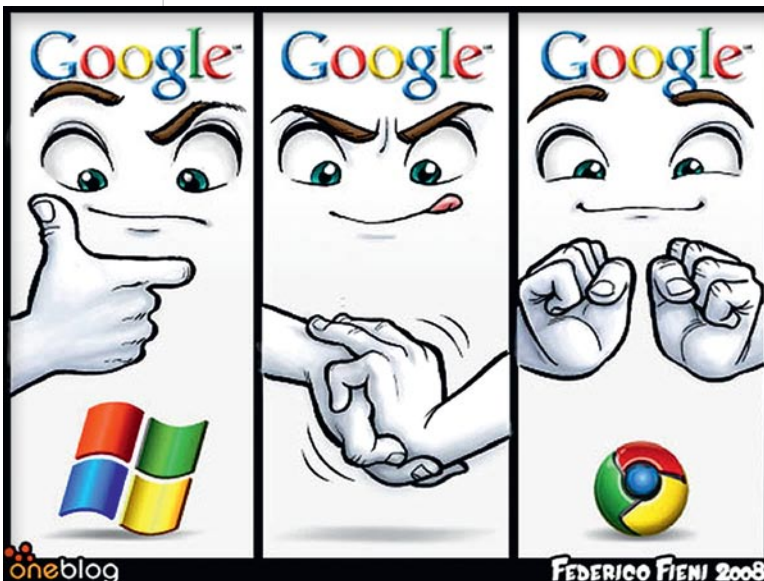
of the users by making computers that always run fast and do not need configuring to work with new hardware, data accessible from anywhere and instant access to email, without wasting time waiting for their computers to boot and browsers to start up. This will not be easy to achieve, but with the help from the open source community, it may be possible to accomplish. If Google can put out a whole OS that is as clean, fast and focused as its individual web products, the Chrome OS could be a revolution. ■

Images : Courtesy of Google



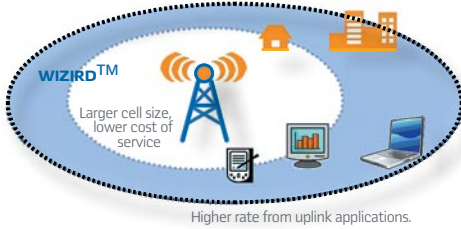
Google Chrome: Screen shots

An artist's view of the development of Google Chrome



For more information visit : <http://www.google.com/chrome>

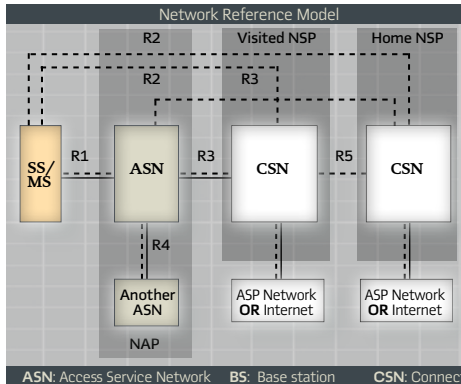
Improved link reliability reduces retries resulting in better throughput. Better in-building penetration.



# 3 WiMAX Transmission Technology

**WiMAX is a telecommunications technology** for wireless transmission of data using a variety of transmission modes with speed up to 3 Mbit/s based on the IEEE 802.16 standard. The name is an acronym for Worldwide Interoperability for Microwave Access created by the WiMAX Forum to promote conformity and interoperability of the standard. The forum describes WiMAX as "a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL".

WiMAX subscriber (or client) units are available in both indoor and outdoor versions from several manufacturers. Indoor units are the size of a cable modem. They are convenient, but due to the increased radio losses, the subscriber must be significantly closer to the WiMAX base station than with external units. Outdoor units are about the size of a laptop, and their installation is comparable to the installation of a residential satellite dish. With the potential of mobile WiMAX, there is an increasing focus on portable units. This includes smart phones, PC peripherals (PC Cards or USB dongles), and embedded devices in laptops.



ASN: Access Service Network BS: Base station CSN: Connectivity Service Network NSP: Network Service Provider SS/MS: Subscriber/Mobile Station NAP: Network Access Provider

Photo: courtesy Intel/ Stuart Ramson



Industry representatives test the nation's first city-wide 4G mobile WiMAX network on a bus to demonstrate its range and speed, Baltimore, MD., Wednesday, Oct., 8, 2008

WiMAX can either operate at higher bitrates or over longer distances, but not both. Operating at the maximum range of 50 km increases the bit error rate, which results in much lower bitrates. Reducing the range to less than 1 km allows a device to operate at higher bitrates.

**LEGEND of Lines:**

Bearer plane ———  
Control plane - - - - -

**WiMAX provides:**

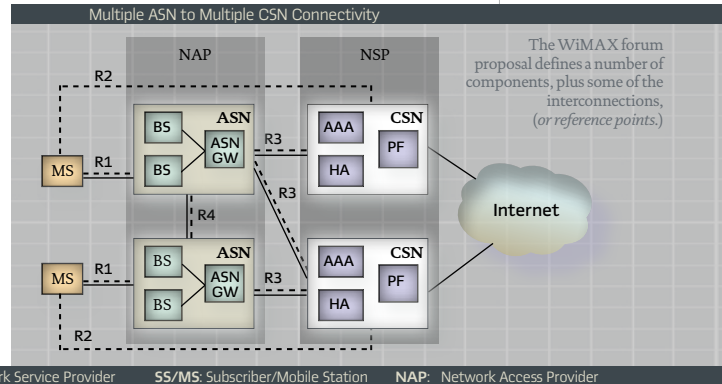
- Higher rate from uplink applications
- User created content
- File uploads
- Real time gaming experience
- Video
- Conferencing, etc.

WiMAX is considered as a replacement candidate for cellular phone technologies (GSM and CDMA), as well as the wireless backhaul technology for 2G, 3G and 4G.

The WiMAX Forum has proposed an architecture that defines how a WiMAX network can be connected with an IP based core network, which is typically chosen by operators that serve as Internet Service Providers (ISP); Nevertheless the WiMAX BS provides seamless integration capabilities with other types of architectures as with packet switched Mobile Networks.

The functional architecture can be designed into various hardware configurations rather than fixed configurations. More information at: <http://www.wimaxforum.org/>

A major role for the Forum is to certify the interoperability of WiMAX products.



The WiMAX forum proposal defines a number of components, plus some of the interconnections, (or reference points.)