4G network

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The telecommunications industry has witnessed spectacular developments in recent years. When 3G third-generation mobile communication network technology has not had enough time to assert its position globally, people have started talking about 4G (Fourth Generation) technology in recent years. But what exactly is 4G? Is there a uniform definition for the future 4G mobile communication network?

Back in time.

For over a decade, the world has witnessed the tremendous success of the second generation 2G mobile communication network. 2G network can be divided into 2 types: 2G-based TDMA network and 2G-based CDMA network. Marking the starting point of 2G network is the introduction of D-AMPS network (or IS-136) using popular TDMA in the US. Next, CDMA network (or IS-95) using CDMA is popular in the Americas and part of Asia, then GSM network using TDMA, was first established in Europe and is currently deployed worldwide. The success of 2G network is due to the services and utilities that it lends to users, typically voice quality and mobility.

Following the 2nd generation, the third generation 3G mobile communication network has been deployed in many parts of the world. The most striking improvement of 3G network over 2G is the ability to provide high-speed packet communication to deploy multimedia communication services.

3G networks include UMTS networks using WCDMA technology, CDMA2000 networks using CDMA and TD-SCDMA networks developed by China. Recently WiMAX technology has also been adopted into 3G relatives alongside the above technologies. However, the success story of 2G network is difficult to repeat with 3G network. One of the main reasons is that the service that 3G offers does not have a significant jump compared to the 2G network. It has only recently been interested in integrating MBMS (Multimedia broadcast and multicast service) and IMS (IP multimedia subsystem) to provide multimedia services.

Where does the 4G concept come from? There are many different definitions of 4G, which are technologically defined and service-oriented. Most simply, 4G is the next generation of wireless mobile communication network. 4G is a solution to overcome the limitations and weaknesses of 3G networks. In fact, in mid-2002, 4G was a conceptual framework to discuss the requirements of a future super high-speed broadband network that allowed convergence to fixed wired networks. ideas and hopes of researchers in universities, institutes, companies such as Motorola, Qualcomm, Nokia, Ericsson, Sun, HP, NTT DoCoMo and many other telecommunications companies with the desire to meet the multimedia services that network 3G cannot meet.

According to the development line .

In Japan, network provider NTT DoCoMo defines 4G with mobile multimedia concept (mobile multimedia) with the ability to connect anytime, anywhere, global mobility and customer-specific service. . NTT DoCoMo see4G as an extension of 3G cellular cellular communication network. This view is seen as a 'linear view' in which the 4G network will have an improved cell structure to provide speeds of over 100Mb / s. With this view, 4G will be the 3G LTE, UMB or WiMAX 802.16m network. In general, this is also an accepted mainstream in China and Korea. Recently on many tech blogs, the information: 'In-Stat said that ITU will announce in 2008/2009, 4G is LTE, UMB and IEEE 802.16m WiMAX'.

Besides, although 4G is the next generation of 3G, the future is not only limited as an extension of the cellular network. In Europe, for example, 4G is seen as the ability to ensure continuous, uninterrupted service delivery with the ability to connect to different types of radio access networks and the ability to select wireless networks. Most suitable for delivering services to users in the most optimal way. This view is seen as 'solidarity'. Therefore, the concept of 'ABC-Always Best Connected' (always best connected) is always considered a leading feature of 4G mobile communication network. This definition is most accepted by many major telecom companies and many researchers and consultants.

From any point of view, it is expected that the fourth generation 4G mobile communication network will emerge around 2010-2015 as a super high-speed broadband wireless network.

Heaven in the direction of 'solidarity' 4G networks will not be a cutting edge technology, capable of meeting all types of services for all users. Recent popular technologies such as WiMAX 802.16m, Wibro, UMB, 3G LTE, DVB-H . although they meet high transfer rates, they are only considered pre-4G technologies (4G money).

The 4G network will be a convergence of many existing and developing network technologies such as 2G, 3G, WiMAX, Wi-Fi, IEEE 802.20, IEEE 802.22, pre-4G, RFID, UWB, satellite . to provide one ubiquitous wireless connection (ubiquitous), anytime, anywhere, regardless of the carrier's network, regardless of what mobile device users are using. Future users will truly live in a 'free' environment, able to connect to the network anywhere with high speed, low cost, high quality service and individual-specific .

'Customer is god' Currently when we buy a mobile connection, that connection is tied to a contract, with network provider constraints. Users have almost no choice other than the service provided by the provider. Each person has at least a few different types of contracts to use different types of services: mobile phone contracts, fixed phone contracts, Internet contracts, GPS contracts, and contracts. co-use mobile TV service, . All users' contacts and connections are subject to strict management of the service provider (so-called "network-centric").

In fact, users are the ultimate goal that a product or technology wants to target. Therefore, just providing high data rates is enough to meet users' needs yet4G need to meet other requirements as well? Here we try together to consider what users need that the current network technology does not meet. That is the key to 4G's success!

Scenario 1 : Before you leave the house to get to work, you need to know information such as train / bus time, traffic congestion, and forecast the time needed to get to work. . Once the user selects a travel vehicle, the information about the time, the time of the next media conversion, . will be updated continuously with real time. While sitting on public transport, you want to read e-mail, listen to radio, watch TV, connect to the company's intranet to prepare documents for meetings .

Scenario 2 : You will probably like to receive attractive shopping, discounted, and entertainment information when you sit relax at home or in the bus. However there will be many people who hate this kind of information. Therefore, this service must depend on the preferences and habits of each user. Similarly, when you travel to a city or a country, you will be pleased to receive information such as maps, places to visit, delicious dishes to enjoy . Every time you arrive in front of a place to visit you will receive specific information about the history and characteristics of the place you are visiting. More special if the information provided to you is in your native language.

The above are just two typical situations that users in the future expect. To do that, the 4G network must put users in a central (user-centric) position, and future services will have to take into account preferences, requirements, locations, situations, attributes. of each user such as occupation, age, nationality .

In brief

Although the 4G term has not been explicitly defined by any standardized organization, the 4G network is expected to meet the following characteristics:

The most expected feature of 4G network is to provide ABC connectivity, anytime, anywhere. To that end, the 4G network will be a heterogeneous network (including many different network technologies), connecting, integrating on an IP-based platform. Mobile devices of 4G will be multi-technology, multi-mode to be able to connect to many different access networks. For this, mobile devices will use SDR solution (Software Defined Radio) to be able to configure many different radio types via a single radio hardware.

The 4G network provides a seamless, uninterrupted transfer solution between many different network technologies and between many different mobile devices. The 4G network provides broadband connectivity at a rate of 100Mb / s and a mechanism to ensure QoS for real-time multimedia services. To overcome the saturation of the telecom market, network providers will have to find customers by customized services as required by customers. 4G network will take users as the focal point.

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