



Delivering Streaming Media to the Mobile Masses

*A primer on the delivery of wireless multimedia content
and associated standards specifications*

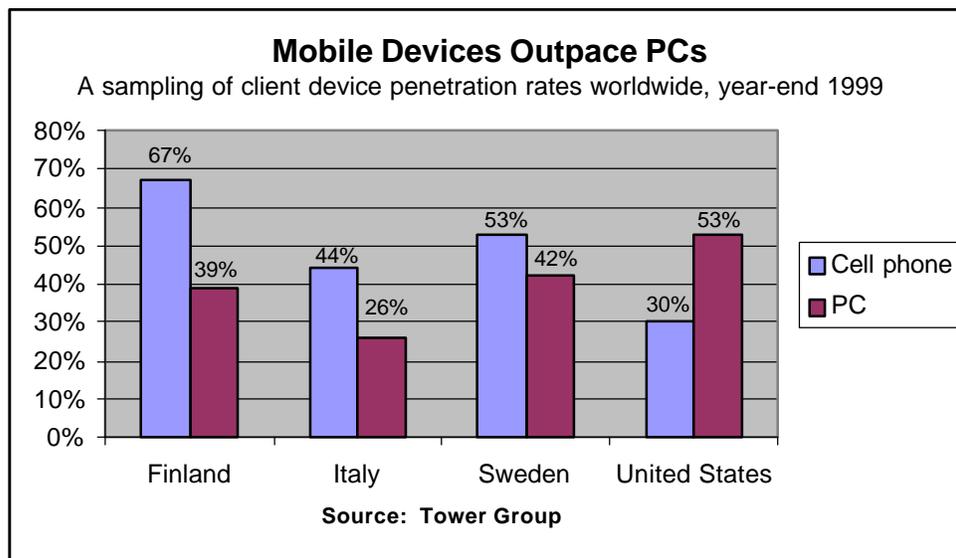
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The wireless multimedia landscape

Wireless networks are poised to begin supporting content-rich applications such as streaming media later this year. One reason is the development of multimedia content for delivery over traditional wired Internet connections is on a collision course with the maturation of the mobile market. Powerful client computing devices capable of receiving full-motion video and streaming voice paired with the Internet's 10-Gbps fiber-optic backbone capacity, for example, is already driving the development of Internet-ready multimedia content for landline networks.

Meanwhile, shipments of wireless Internet access devices will sustain double- and triple-digit growth through 2004, according to researchers, as mobile devices proliferate and displace traditional PCs as the preferred Internet access mechanism. Soon, these users will demand access to the same services they enjoy today on their desktop computers via their handheld devices. In addition, mobile users will seek a host of new services aimed directly at their mobile needs, such as location-based information services. These industry developments are setting the stage for the mass delivery of rich multimedia content over mobile networks.



As mobile device usage surpasses that of traditional computers, wireless users will soon demand the same rich multimedia services on their mobile devices that have been available for desktop PCs. In addition, they will seek new services aimed specifically at their mobile needs, such as location-based information services.

For many years, standards fragmentation has stalled progress in the mobile industry at the airlink protocol layer and in the Internet industry with multiple competing streaming media standards. To prevent fragmentation from stunting the growth of the wireless multimedia market, a group of 56 industry players called the Wireless Multimedia Forum (WMF) has begun specifying technologies that they will use to foster interoperability among wireless multimedia products and content throughout the marketplace. Their intent is to cultivate the widespread delivery of new content-rich services across IP-based wireless networks by enabling products and services from many players to work together. This work will build new revenue streams for content developers and service providers and provide new application choices for the user community. All this work accelerates the marketplace for wireless multimedia content delivery, both for today's 2G wireless networks, which run at speeds below 64 Kbps, and for emerging higher-speed 2.5G and 3G networks.

This document examines the technical basics and business implications of the industry's work to date in establishing a wireless multimedia standards-based framework.

RTFD Version 1.0: The market accelerator

Early this year, the Wireless Multimedia Forum Technical Working Group (WMF TWG) published its first document, which recommends technologies, formats and protocols that can be used by the various supply-chain members in the streaming multimedia wireless space. Equipment makers, content developers, and service providers that build products conforming to the specifications in Recommended Technical Framework Document (RTFD) Version 1.0 will enable equipment from many vendors to interoperate and will allow software interfaces to be interchangeable across networks.

Achieving such consensus will accelerate the market for multimedia content and services. For example, having a common technology framework for wireless multimedia delivery will reduce the number of multimedia platforms that content providers will have to support, hastening their time to market with new content and services and stepping up the pace at which their content can reach a broad, far-flung user audience.

The RTFD Version 1.0 represents the first fruits of the WMF TWG's labor—the culmination of a year's worth of cooperative work among industry players. This initial standards specification document defines the compression, session initiation/call setup, file format and streaming mechanism to be used between content creation subsystems, multimedia distribution servers and wireless multimedia terminals in a streaming multimedia network system. RTFD implementations are expected to result in the delivery of interoperable streaming multimedia services to any mobile device beginning later this year.

New mobile services could include the delivery of news, weather, stock and sports updates to mobile users. In addition, traveling parents could receive clips of a child's soccer game or performance in the school play. Geographic location services could be combined with dating services, whereby handheld users could receive a multimedia profile of a dating service candidate who lives in the geographic ballpark of the user's location. Children in Japan are already using cell phones to send animated multimedia greetings to one another, and interactive games that could be streamed among participating users across wireless networks are in development in companies across the globe. With new streaming wireless services, traveling parents could, for example, receive clips of a child's soccer game or performance in the school play.

In recommending specifications for common use in wireless multimedia networks, the WMF cooperates with related worldwide standards bodies such as the Third Generation Partnership Project (3GPP) and the International Telecommunications Union (ITU). It should be emphasized that the WMF is not a standards body. The WMF TWG strives not to “reinvent the wheel” where well-accepted technologies already exist for a required

network communications function. Instead, the group specifies which existing standards-based technologies should be used collectively, based on technical merit, cost, bandwidth considerations, and other criteria, to achieve multivendor interoperability.

RTFD Version 2.0, already in development, will recommend standards for additional mobile streaming media capabilities such as quality of service (QoS), scene description (where graphics and text should appear, relative to multimedia content) and billing capabilities. It will also recommend standards for delivering downloadable multimedia content such as video email and MP3 audio content.

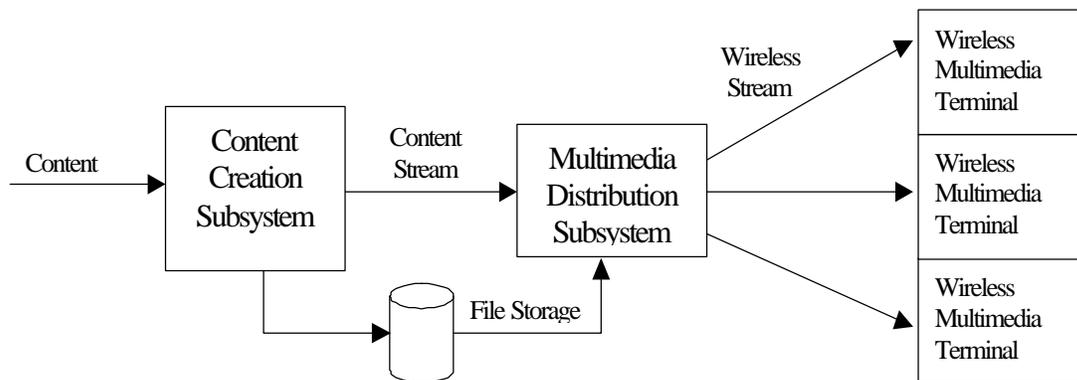
Streaming media requirements

RTFD Version 1.0 explicitly addresses the streaming multimedia (SMM) application, which includes both on-demand and live streaming using voice and video as the primary media types. The components of an SMM system include the following:

- Content creation subsystem
- Multimedia distribution servers
- Wireless multimedia terminals

The wireless multimedia system

The *content creation subsystem* is responsible for converting raw or compressed media content stored in a file or captured in real time to a content stream suitable for delivery. It then forwards it on to the multimedia distribution server. To do its job, the content creation subsystem makes use of certain compression technologies and must format the files. The RTFD Version 1.0 recommends the mandatory use of GSM-AMR for speech compression/decompression (EVRC optional), H.263 and MPEG-4 for video compression/decompression, and the MPEG-4 file format.



In a wireless multimedia network system, content is generated by the content creation subsystem, distributed to users by the multimedia distribution servers and displayed by wireless multimedia terminals.

The job of the *multimedia distribution server*, once it has received the multimedia content from the content creation system, is to stream live or stored content to wireless multimedia terminals. RTFD Version 1.0 defines streaming communication between the content creation subsystem and the multimedia distribution server only for stored content. This multimedia distribution server also can manipulate or repurpose content.

The market for multimedia distribution servers will grow to nearly \$1.4 billion in 2005, according to high-tech market research firm Cahners In-Stat Group. The number of streaming media servers sold will nearly double every year through 2003, the firm predicts.

The role of the *wireless multimedia terminal* is to receive streamed multimedia content from the multimedia distribution server and display it to the user. For streaming media applications, the content may be either live or on-demand. The recommended standards for use in both wireless multimedia distribution servers and wireless multimedia terminals are the following:

- GSM-AMR for speech compression/decompression (EVRC optional)
- H.263 and MPEG-4 for video compression/decompression
- Real Time Streaming Protocol (RTSP) and SDP for session initiation, setup and media control

- Real-Time Protocol (RTP) over UDP as the transport protocol
- The MPEG-4 file format

Work with Worldwide Standards Bodies

The WMF has targeted about 20 worldwide standards bodies, forums, and alliances engaged in mobile network activity as partners to ensure consistency across all platforms and spur growth in the wireless arena. For example, the WMF has recently submitted the RTFD and a file format proposal for wireless multimedia based on MPEG-4 compression and the Apple QuickTime File Format to the 3GPP.

3GPP is an international alliance of standards bodies creating specifications for interoperable high-speed, global mobile networks. The WMF recently gained status as a Market Representation Partner of 3GPP2. In addition, the WMF is actively cooperating with the recently formed Internet Streaming Media Alliance (ISMA) and the IPv6 Forum.

Conclusion

Content providers and equipment-makers that design their applications and equipment in compliance with RTFD recommendations achieve a high degree of interoperability in the marketplace with other services and equipment. This interoperability significantly expands the user audiences that content providers can reach with their information, entertainment and application services. It also enables network equipment-makers to penetrate new service provider accounts, because service providers are not locked into using a single vendor's products to ensure equipment compatibility.

Meanwhile, service providers who demand RTFD compliance in their equipment gain a broader choice of vendors, which gives them the freedom to select best-of-breed products in the various segments of their network infrastructures. Overall, the establishment of a standards-based technical framework for streaming-media interoperability (and for other capabilities to be specified in forthcoming versions of the RTFD) will provide substantial new revenue stream opportunities for content developers, service providers and equipment-makers, as well as new application choices for users.

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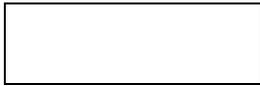
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