

*converging multimedia for the mobile world »*

# **thinMobileCDN™ White Paper**

**Multimedia Content Delivery to Any Mobile Phone on  
Multiple Networks**

***tmi***



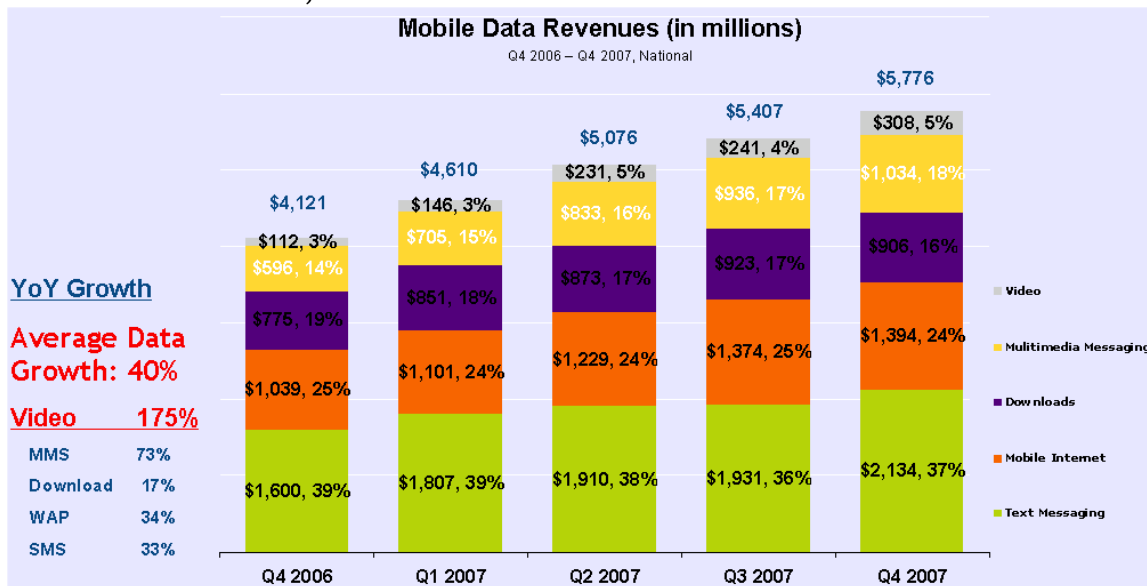
# 1. Content Delivery Network (CDN)

As usage of the internet began to explode in the early part of this decade, media companies began to realize the importance of delivering audio and video content to end users over the internet. In order to do so, it was critical to insure that they could guarantee exceptional Quality of Service (QoS) to the end-consumers. Initially, this multimedia content delivery was regularly interrupted by service failures as a result of network congestion caused by an overload of requests for these contents. To resolve this problem, media companies would need to install additional, costly network infrastructure components. The alternative solution to this problem was for media companies to use an ASP Service from CDN companies such as Akamai and LimeLight Networks. CDN companies solved this problem by offering a service that provided traffic routing, content distribution, reporting, storage, content protection and other services. Today, nearly all media companies use CDN services to deliver their content to end users via the internet.

# 2. What about Mobile?

## Mobile Video

The past two years have seen a significant growth in the use of mobile phones for internet search and for watching videos and listening to music or talk radio. US mobile data ARPU has increased 40% over the last year, while video ARPU has grown at an astonishing 175%--significantly out-pacing data intensive services such as MMS, WAP and SMS.



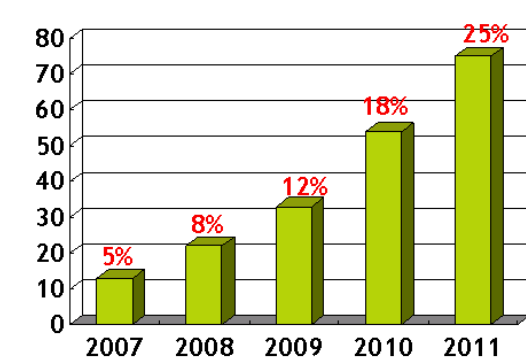
## Content Availability

To accommodate the demand for mobile data services, most US wireless carriers provide unlimited data plans at reasonable prices. The result of these lower prices is that more and more consumers are interested in accessing multimedia content on their mobile phones. Media companies recognize the value in “mobile-izing” their multimedia content; but, also, acknowledge the requirements for providing exceptional QoS based on lofty consumer expectations which are a result of the quality of online multimedia services. A recent survey of 1000 consumers in May 2008 indicated that 45.5% of consumers list video quality as the most unsatisfactory component of mobile video services.

## Smartphones

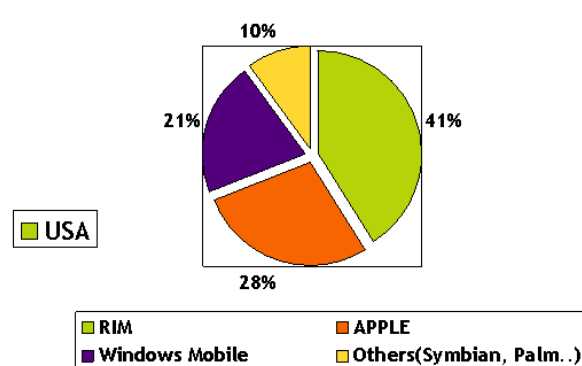
As a result of the competition in the smartphone market initiated by the iPhone, market share for these devices continues to experience explosive growth. Most new smartphones introduced to the market include video streaming capabilities. Recently this list includes devices such as the Nokia N95, BlackBerry Bold, Samsung Instinct, LG Dare and many others. According to IDC research, the smartphone market share in the US is 8% as of 2008 and is expected to grow to 25% by 2011.

Smartphone Sales in the US



\* source: IDC May 2007

Market Share by Platform



\* source: Canals March 2008

## 3. Mobile Challenges

The primary barrier for media companies to provide mobile media services are the technical difficulties in guaranteeing a high QoS for multimedia content over wireless networks. There are a number of components which factor into providing mobile video and each has an impact on QoS.

## Content Conversion

In order to enable mobile users to access multimedia content, it needs to be converted into a mobile-applicable format. Most mobile phones do not support standard online content formats like FLV, AVI, WMV and others. Additionally, the required content format including codec type and resolution is different for each phone model. To accommodate this, each piece of content needs to be converted to multiple pieces of content which are mobile-specific and optimized to provide the highest quality for each phone model. For example, one piece of content needs to be converted into a specific format that would be applicable for an iPhone, BlackBerry, Windows Mobile Device and multiple feature phones. This presents a big burden for media companies to keep track of new phone models and insure they are providing the highest possible multimedia quality for each phone model. Media companies require a solution which automates the conversion of each piece of content for each phone model.

Devices	Media Container Format	Best Video Codec	LCD Resolution	Best Audio Codec
Apple iPhone	3GP	H.264	480x320	AAC
Samsung Instinct	3GP	H.264	432x240	AAC
Moto Q	WMV	WMV	320x240	WMA

## Video Quality

The bandwidth for wireless networks is still considerably slower than that for online networks. Providing high multimedia quality with the limited bandwidth that is available in wireless networks requires a codec engine with high compression capabilities.

## Device Detection

In a scenario where a piece of content has been converted to several mobile-applicable formats, a second, equally necessary component is the ability to detect the device that is requesting the content. Without this capability it would not be possible to link the ideal format with the requesting device. To properly provide multimedia services on mobile it is imperative that the system can recognize what device is making the request for content in order to serve the appropriate version of the content.

## Network Adaptation

Bandwidth on wireless networks changes constantly. Unless the delivery server is able to adapt to the constantly fluctuating network, it cannot guarantee a

high QoS. It is necessary for the system to support features like traffic shaping and/or dynamic bit-rate adaptation.

## Real-time Content Conversion

Another requirement for a mobile multimedia content delivery system is the ability to deliver live content. Live sports or reality TV shows are perfect examples of content that can be provided on mobile devices so consumers who are unable to access a television or radio can still view or listen to the event. This capability requires a real-time transcoding solution which ingests the live feed of the content.

## Existing Content Management Systems

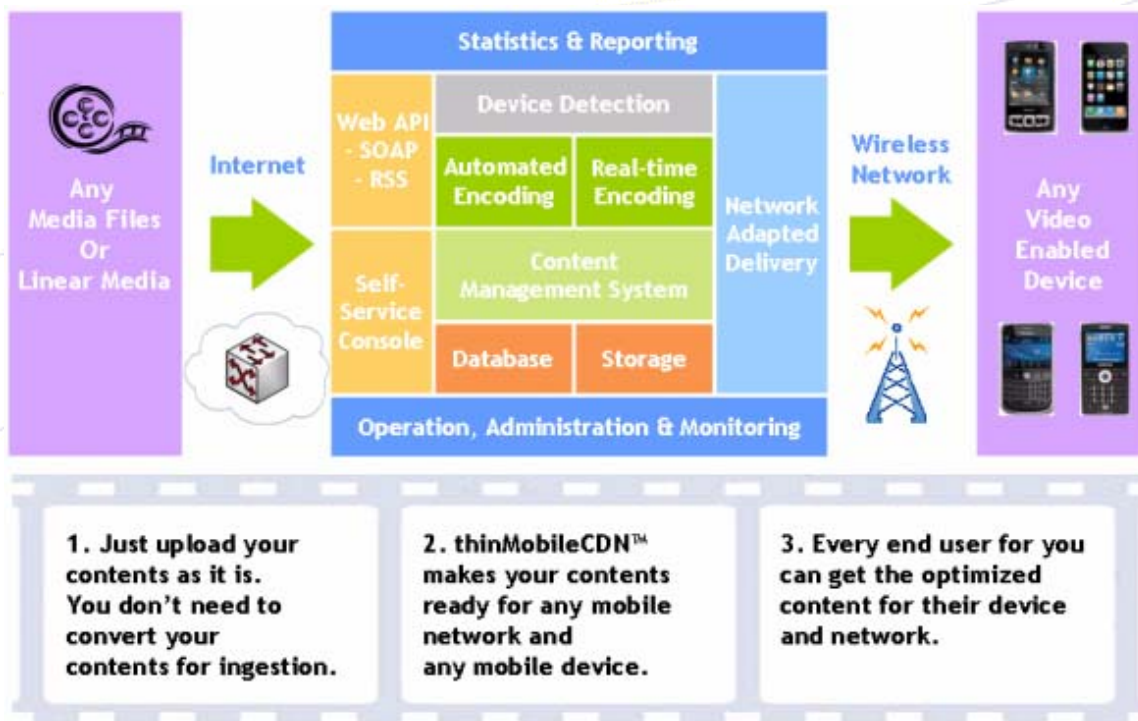
To provide online multimedia services nearly all media companies currently utilize some type of a Content Management System (CMS). The types of system and capabilities of each vary significantly from company to company. These media companies recognize the potential of the mobile video market but require a mobile solution that can be easily integrated into their existing CMS.

## Summary

The current mobile video market is expected to have revenues of \$1.2B in 2008 and is growing rapidly. Media companies are beginning to see revenues from mobile multimedia services and now realize the technical hurdles that must be crossed in order to provide a high QoS mobile service. These companies recognize that a mobile CDN solution which can resolve all of these technical difficulties is required to meet their explosive growth expectations.

## 4. Why thinMobileCDN™?

thinMobileCDN™ is Thin Multimedia, Inc.'s (TMI) mobile content delivery platform which addresses each of the technical challenges listed above. thinMobile CDN™ guarantees exceptional QoS across an extensive range of mobile devices. thinMobileCDN™ provides a Web API and an easy-to-use Web GUI for easy integration with our customer's CMS. thinMobileCDN™ also provides customizable, powerful analytic content usage reports which assist media companies in developing marketing and advertising campaigns to attract new customers and increase revenue from existing ones.



TMI's thinMobileCDN™ was introduced to the market in 2003 and is currently commercialized by a number of major media companies including Major League Baseball Advanced Media to provide exceptional QoS for mobile services. Media companies can be up and running using TMI's thinMobileCDN™ ASP service in as little as four (4) weeks. Contact TMI today to learn how we can help you "mobile-ize" your existing content and create a new revenue source from multimedia services.

## For More Information

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