



Media Servers in the Digital Home

A Parks Associates White Paper

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Table of Contents

1.0	The Role and Definition of the Media Server.....	1
1.1	Why the Media Server Now?.....	1
1.2	Defining the Media Server.....	2
2.0	Industry and Business Drivers for the Media Server.....	3
2.1	The Hard Drives Business Seeks New Opportunities.....	3
2.2	Service Provider Competition.....	4
2.3	Taking Cues from the Custom Installer Market Error! Bookmark not defined.	
3.0	Consumer Drivers for the Media Server	5
4.0	Growth and Outlook of the Product Category.....	8

List of Figures

Figure 1	Media Servers and Primary Suppliers	2
Figure 2	Industry Definitions of the Media Server.....	3
Figure 3	Unit Shipments of Consumer Electronics Hard Drives	4
Figure 4	Content Services, Media Servers, and Receivers.....	5
Figure 5	What Types of Digital Content are Stored on Home Computers/Other Hard Drives?	7
Figure 6	Adoption of Digital Capture/Playback Devices	8
Figure 7	Annual Sales: Media Server Form Factors.....	9

1.0 The Role and Definition of the Media Server

1.1 Why the Media Server Now?

The manner by which consumers will access, store, and share personal and commercial content is undergoing a fundamental change, thanks to both demand- and supply-side drivers. As end users build personal libraries of self-generated digital content (primarily photos and home videos) and acquire commercial content such as digital music and video, they will be seeking more secure backup and sharing solutions. At the same time, competitive pressures and the needs of both service providers and end-user equipment manufacturers are encouraging industry players to develop and deploy differentiated consumer electronics and home computer form factors, characterized by ever-increasing storage, home networking capabilities, and the capability of sharing different content and services in and outside of the home.

These push and pull drivers set the stage for the widespread availability and uptake of so-called “media servers,” a dynamic category of products that will expand the reach of a variety of players – service providers, equipment manufacturers, home networking vendors, and other component providers. Our newly published report *Media Servers: Analysis and Forecasts* identifies and forecasts key categories of media server products. It examines the usage scenarios for each form factor based on Parks Associates’ primary consumer research.

This paper focuses on the growth opportunities for a number of product form factors that fit the definition of in-home media servers. It provides commentary on both industry and consumer drivers for the distribution and uptake of media servers. For purposes of this paper, we have identified four categories of media servers:

1. **NAS (network-attached storage) Media Servers** function primarily as data and content backup devices – mainly in concert with home computers.
2. **Multimedia PCs** include hardware and software features that equip them to operate better in a “ten-foot environment.” These features allow users to easily organize and find an array of content (photos, music, video, etc.) and tap into broadcast cable or

satellite TV (if equipped with a tuner) as well as a growing body of Internet video content.

3. **Set-top Media Servers** have large hard drives and digital video recorder (DVR) capabilities plus the added ability to stream content via a home network to additional clients and televisions in the home.
4. **High-end Media Servers** are mainly the purview of the custom installer. They are characterized by very large hard-drive storage and many connections – audio, video, serial, etc. – available for both receivers and controllers.

Media Servers and Primary Suppliers			
NAS Media Servers	Multimedia PCs	Set-top Media Servers	High-end Media Servers
			
<ul style="list-style-type: none"> - Axentra - Buffalo Technology - Infrant Technologies Inc. - Iomega Corp. - Maxtor Corp. 	<ul style="list-style-type: none"> - Alienware - Dell - Gateway - H-P - Niveus Media - RICAVISION - Sony - Toshiba - ViewSonic - ZT Group 	<ul style="list-style-type: none"> - DISH Network - Motorola - ReplayTV - Pace Micro Technology - Scientific-Atlanta (Cisco Systems) - TiVo 	<ul style="list-style-type: none"> - AMX - Arrakis - Axonix - Control4 - Dedicated Devices - ELAN Home Systems - ESCIENT - HomeLogic - Imerge - Integra - Kaleidescape - Linn - McIntosh - ReQuest - Yahouse
<small>Source: Media Servers: Analysis and Forecasts © 2006 Parks Associates</small>			

Figure 1 Media Servers and Primary Suppliers

1.2 Defining the Media Server

A media server is a platform that can provide digital content to other platforms through certain networking technologies. A digital media server in a whole-home entertainment environment should also have the ability to aggregate content delivered through different platforms or located on different devices on the home network and distribute it to any

device in any room of the house. Finally, the capabilities of the media server include enforcement of content protection and rights management rules.

Industry Definitions of the Media Server	
Industry Definition	Parks Associates' Requirements
<p>Digital Media Server (DMS) devices provide media acquisition, recording, storage, and sourcing capabilities, as well as content protection enforcement as required. DMS devices often incorporate capabilities of rendering and processing as well.</p> <p><i>Source: 2005 Digital Living Network Alliance (DLNA)</i></p>	<ol style="list-style-type: none"> 1. Integrated hard-disk drive (HDD) storage capabilities 2. Either integrated local-area network (LAN) capabilities or network interfaces (USB, 1394, etc.) to allow the server to connect through the home network via a router. 3. Appropriate software capabilities to make the content available to other network-connected devices.

Figure 2 Industry Definitions of the Media Server

2.0 Industry and Business Drivers for the Media Server

Technology developments have advanced the media server product from concept (remember the discussions in the late 1990s about the “media furnace”?) to market reality. Chief among the technology drivers are new and improved variants of both wired and wireless home networking solutions that better facilitate (with enhanced throughput, range, and quality-of-service measures) the in-home streaming of multimedia content. In addition, a number of companies developing integrated microprocessors – so-called system-on-chip solutions – have now entered the networked storage market. With these solutions, manufacturers can take advantage of decreases of up to 25% in bill-of-materials (BOM) prices. The entry of third-party middleware vendors and media server-specific software solutions has also allowed manufacturers to more quickly (and cost-effectively) build media server (and receiver) capability into a variety of end-user products.

2.1 The Hard Drives Business Seeks New Opportunities

From a business standpoint, several key variables are driving a number of companies to more aggressively position themselves within the media-server marketplace. Hard-drive manufacturers are seeking to boost their sales beyond the home computer and enterprise

markets that have been a staple of their business. To this end, they see significant opportunity in developing storage solutions for the consumer electronics industry, including media servers. This strategy is reflected in recent data from Seagate Technology (**Figure 3**).

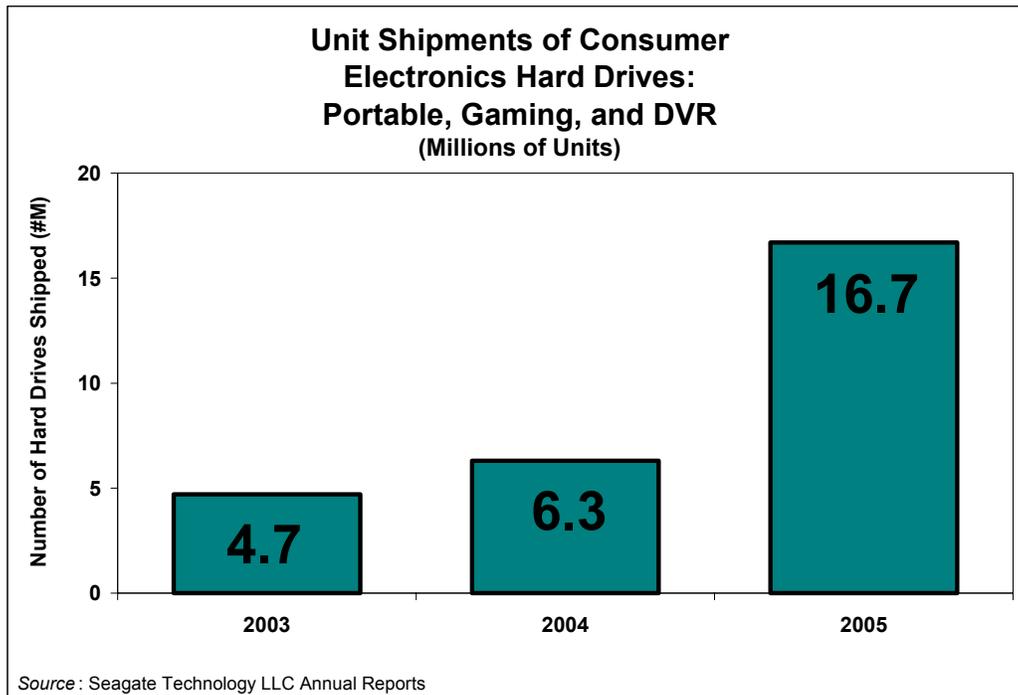


Figure 3 Unit Shipments of Consumer Electronics Hard Drives

2.2 Service Provider Competition

With global telecom players entering the market for multichannel television services, the competitive dynamics that exist among the various service providers will shape the delivery business models. Competition will expand the opportunities for customer premise equipment beyond the set-top box. Already, competition between the main players in the United States cable market and DBS satellite providers has sped up the evolution of the digital video recorder (DVR) from a solution deemed “too early for its time” to an absolute necessity in luring new consumers, keeping existing subscribers, and building average revenue per subscriber/user (ARPU). Service providers are finding that the digital video recorder enhances revenue per subscriber, both on a monthly subscription basis and in other services, as data indicate that customers with a DVR are significantly more likely to use additional fee-based services such as video-on-demand.

As the competition to acquire and retain subscribers for access, entertainment, and communications services heats up, the media server and related receivers will play an integral role in delivering enhanced content applications. The delivery of enhanced video services to subscribers will require feature-rich fixed media server platforms across a variety of form factors, including the set-top box, the multimedia PC, and other consumer electronics platforms with media server functionality. Each video provider will also seek to expand access to content on a variety of mobile and portable platforms, which will enhance the media server's role as a critical mediator between fixed and mobile services.

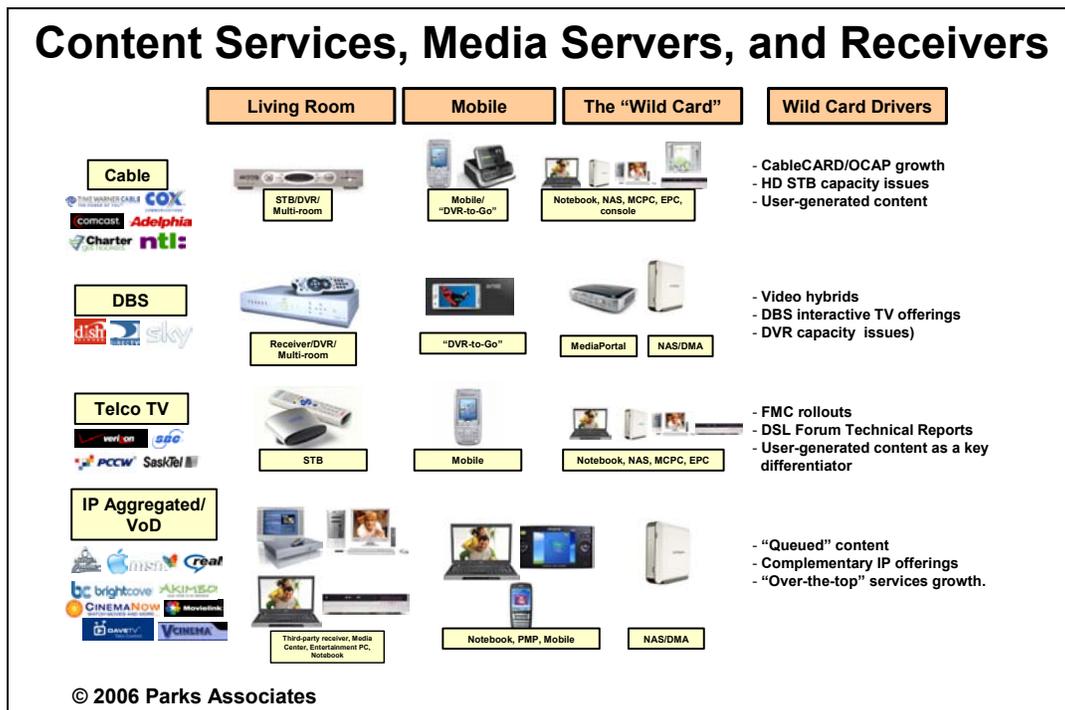


Figure 4 Content Services, Media Servers, and Receivers

3.0 Consumer Drivers for the Media Server

Many consumers are already avid adopters of storage-rich platforms, thanks to their acquisition of portable digital music players, the PVR/DVR, and other drive-based products. Outside of storage directly embedded into end-user platforms, consumers' use of platforms such as the home computer to aggregate digital media will spur the purchase of expanded and/or supplementary drives. Parks Associates' *Profiles of PC Usage* study finds that significant percentages of consumers are expecting their digital storage needs to grow by at least 50% in the next year.

The following factors are driving this demand:

- The growing penetration of broadband Internet, which drives consumer adoption of digital entertainment content such as downloaded music files.
- Consumer adoption of digital devices that can create, capture, and record digital content, such as digital cameras, digital camcorders, and portable digital music players.
- The inclusion of hard drives into consumer electronic devices such as portable music players, game consoles, and digital video recorders, creating a hard drive farm in the home.
- Decreasing price and increasing capacity for hard drives.

In a nutshell, the growth of digital multimedia content is the most powerful driver of consumer demand for storage capacity. A large percentage of consumers have stored different forms of digital content on their PCs and hard-drive-based consumer electronics devices. Among households with a data network, which are also likely to be early adopters of digital technologies, ownership of digital content, especially music and video content, is even more common. As these households accumulate an ever-growing amount of digital content, they will seek solutions to store, archive, and back up such content at a central location. In addition, they will look for technologies that can network PC and consumer electronics and distribute multimedia content around the house. The growth of high-definition video content, which has a much larger footprint and requires even more storage capacity, will only accelerate this process.

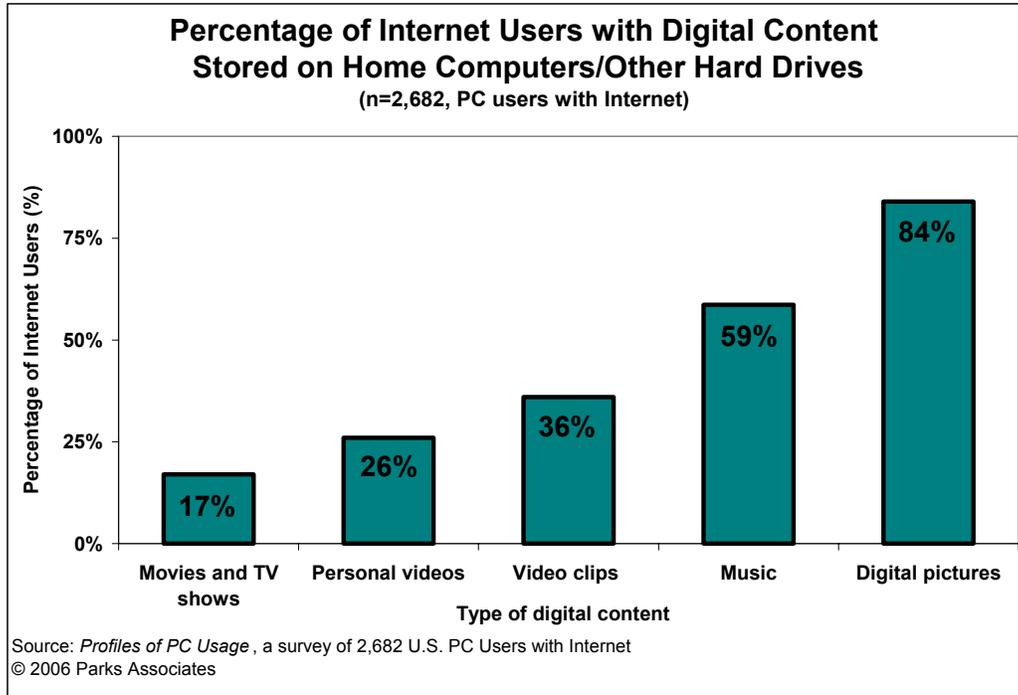


Figure 5 What Types of Digital Content are Stored on Home Computers/Other Hard Drives?

In addition to its ability to pull content from such sources as the Internet, the home computer complements the portable form factors that have grown popular for media rendering (the digital camera) and playback (the portable digital music player). As a server, the home computer form factor stores downloaded content as either the primary or auxiliary storage point, and it provides a simple interface for organization, editing, and other features. As the portable media form factors continue to penetrate households in greater numbers (**Figure 6**), the home computer and other media servers will grow in importance in aggregating, securing, and sharing an array of content. This trend has begun with photos and music but will certainly migrate to video and games as well.

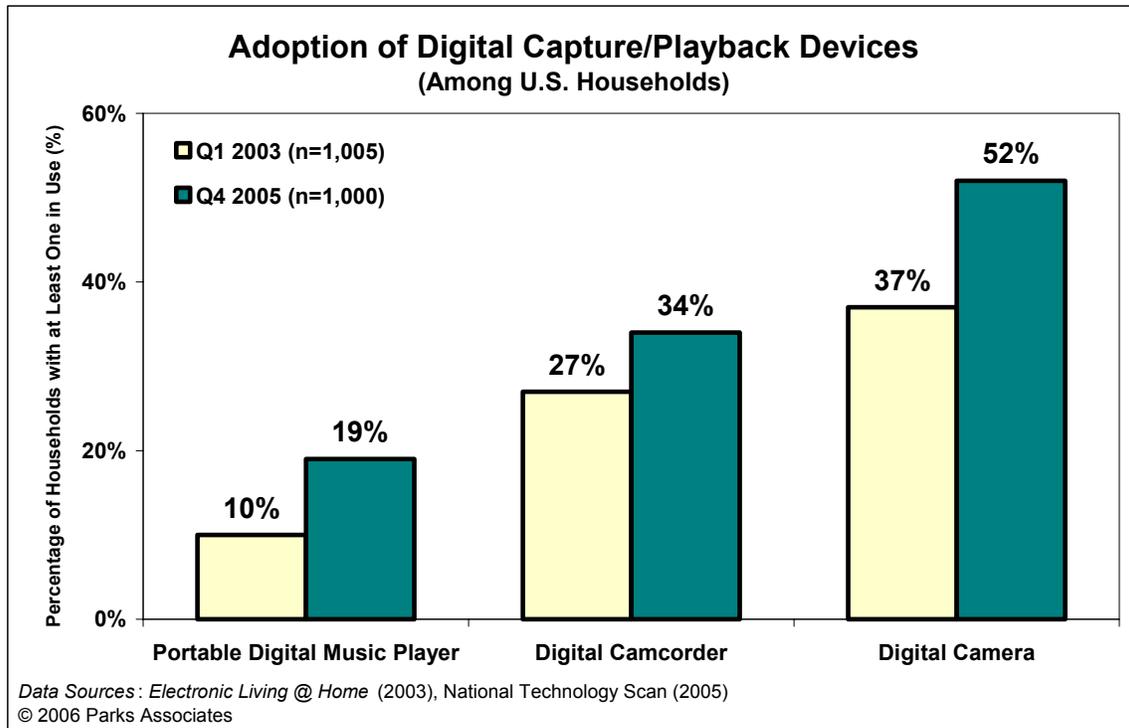


Figure 6 Adoption of Digital Capture/Playback Devices

4.0 Growth and Outlook of the Product Category

Annual sales of media server form factors will be significant over the next five years, to the tune of nearly 50 million shipments in 2010 (see **Figure 7**). Of the four form factors identified in *Section 1.1*, growth and success of each will depend on the following variables:

- **NAS Media Servers:** Continue to market the products for their ability to secure and protect high-value content. Expand consumer education about the capabilities of various advanced multimedia and entertainment solutions. Seek complementary digital media adapter solutions that can be bundled as a seamless “distributed entertainment” package together with the NAS device.
- **Multimedia PCs:** Embrace current consumer use case for media creation and sharing. Work to expand relationships with providers of compelling content.
- **Set-top Media Servers:** Initiate with whole-house DVR functionality and partner with service providers seeking enhanced fixed-to-mobile services.

- **High-end/Dedicated Media Servers:** Embrace the complementary nature of the media server in home theater and multiroom audio installations. Target dedicated audio and distributed music applications for a middle-market push.

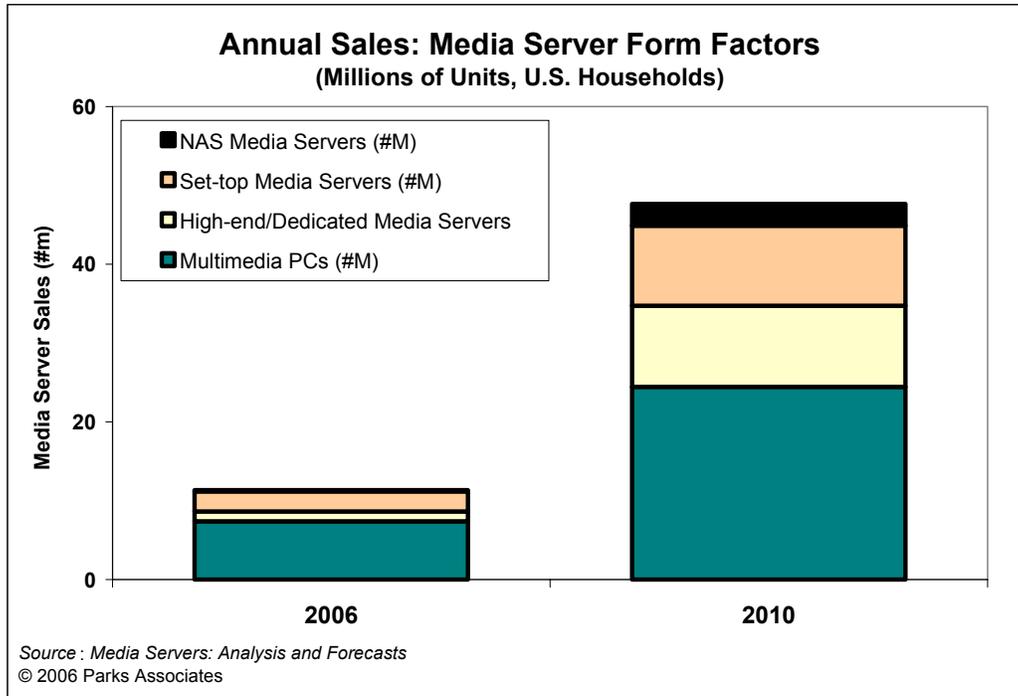


Figure 7 Annual Sales: Media Server Form Factors

About the Author:

Kurt Scherf studies developments in home networks, residential gateways, digital entertainment, technology development in the housing market, and residential and building management and controls. Kurt is the sole author or contributing author/analyst to more than 40 research reports and studies produced by Parks Associates since 1998. Kurt is a frequent speaker at conference and events around the world, and is frequently cited in the industry and general business press. Kurt is a certified Focus Group Director. Kurt joined Parks Associates following a career in political research and multi-tenant dwelling management. He earned his BA from The University of Iowa.

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About Parks Associates: Parks Associates is a market research and consulting firm focused on all product and service segments that are “digital” or provide connectivity within the home. The company’s expertise includes home networks, digital entertainment, consumer electronics, broadband and Internet services, and home systems.

Founded in 1986, Parks Associates creates research capital for companies ranging from Fortune 500 to small start-ups through market reports, multiclient studies, consumer research, workshops, and custom-tailored client solutions. Parks Associates also hosts multiple fall events and co-hosts CONNECTIONS™ (in partnership with the Consumer Electronics Association) each year. www.parksassociates.com.