

**FOR IMMEDIATE RELEASE**

**Hitachi Develops Streaming-Optimized Storage Appliance**  
Enhancing Video-on-Demand Services from a Windows Media® server

Tokyo, Japan, March 13, 2007--- Hitachi, Ltd. (NYSE:HIT/TSE:6501) today announced that it has succeeded in the implementation of a prototype streaming storage appliance optimized for Video-on-Demand (VoD) services, designed to be used with Microsoft® Windows Media® Services 9 Series servers.

This prototype storage appliance, which includes the Hitachi streaming-optimized kernel and innovative streaming engine software, has the ability to execute streaming video delivery for VoD services with a Windows Media server. Hitachi compared the video delivery performance of a Windows Media server in a simulated environment for two configurations: a server attached to the Hitachi streaming-optimized storage appliance and a server attached to conventional storage. Hitachi's researchers found that the configuration with the Hitachi streaming-optimized storage appliance was able to deliver more than three times as many streams as the latter configuration.

The recent spread of broadband networks has enabled HD (high definition) video, such as movies, to be delivered over the Internet. To meet customer expectations, a high performance streaming server system that can concurrently store and deliver many HD quality video streams with assured quality is critical. In order to achieve such high performance delivery, VoD service providers have usually needed to add both servers and storage to their systems, increasing both equipment and management costs.

In response to this need, Hitachi researchers embarked on the development of a streaming-optimized storage appliance equipped with video stream delivery functions. By embedding the Hitachi streaming-optimized kernel and streaming engine software, video can be streamed directly from the storage appliance without passing through an external streaming server. As a result, scalability and performance can be increased for an existing streaming media server by simply adding a storage appliance. Furthermore,

video stream delivery scalability can be realized linearly by simply adding multiple storage appliances to the original streaming media server, contributing to reduced server equipment and management costs.

The Hitachi streaming-optimized storage appliance is designed to be compatible with Windows Media Services 9 Series, a widely adopted streaming server. Video delivery from Windows Media servers can be divided into two main processes: administration (authentication, authorization, playlist parsing, logging, etc.), and streaming. With the Hitachi streaming-optimized storage appliance, the Hitachi appliance provides the streaming engine, while all the administration is handled by the Windows Media server. By offloading the streaming to Hitachi streaming-optimized storage appliances, video stream throughput can be increased more than three times per unit, adding clear value for Windows Media solutions.

### **Technical Features**

The Hitachi streaming-optimized kernel is equipped with several key functions, including:

#### **1. Hitachi streaming-optimized kernel features**

Together, the following streaming functions enable highly optimized video delivery and scalability that cannot be realized by a typical streaming server and backend storage solution.

##### **(a) Zero-Copy I/O function**

The Hitachi streaming-optimized kernel includes a timing control mechanism within the kernel that eliminates memory copies between user and kernel modes, enabling optimized video stream delivery and preventing video degradation that can result from timing-related packet loss.

##### **(b) Video stream-prioritized task scheduling mechanism**

The Hitachi streaming-optimized kernel controls the CPU allocation timing. This mechanism ensures that each video stream delivery task receives prioritized CPU time, guaranteeing on-time delivery of the video stream to the client, even when the CPU load is very high.

##### **(c) Traffic-shaped Video Stream delivery**

The Hitachi streaming-optimized kernel controls video stream delivery timings and greatly minimizes the number of packets to be sent simultaneously (less than 10 packets even for HD-quality video). This traffic shaping helps prevent packet loss and ensure high quality video delivery.

#### **2. Streaming engine software enables video stream delivery directly from storage**

The Hitachi streaming-optimized storage appliance executes video stream delivery through its streaming engine software, which is completely compatible

with Windows Media 9 Series unicast streaming protocols. Therefore, video streams delivered from the Hitachi appliance can be played back using most Windows Media clients, allowing subscribers to play video without obtaining or setting up any customized client software. This compatibility with the Windows Media platform reduces costs for VoD delivery, as performance can be increased in existing delivery systems by simply replacing or adding storage appliances at a low cost.

The prototype of the Hitachi streaming-optimized storage appliance is based on a Hitachi midrange storage device, and achieves 3Gbps streaming (150 streams of 20Mbps HD video delivery) per storage appliance. Hitachi will continue both hardware and software development to realize even more dramatic performance gains going forward. As next steps, full production of the storage appliance is being considered, as well as a high performance, low cost, video delivery service platform.

The Hitachi streaming-optimized storage appliance prototype will be on exhibit at CeBIT '07, to be held from 15<sup>th</sup> to 21<sup>st</sup> March 2007, in Hanover, Germany.

“Hitachi’s new streaming technology possesses performance and scalability advantages that will appeal to many service providers,” said Chris Knowlton, Lead Program Manager for Windows Media Services at Microsoft. “Microsoft and Hitachi will continue our close collaboration around Windows Media Technologies to provide our customers with the most scalable and cost-effective streaming solutions.”

**About Hitachi, Ltd.**

Hitachi, Ltd., (NYSE: HIT / TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 356,000 employees worldwide. Fiscal 2005 (ended March 31, 2006) consolidated sales totaled 9,464 billion yen (\$80.9 billion). The company offers a wide range of systems, products and services in market sectors including information systems, electronic devices, power and industrial systems, consumer products, materials and financial services. For more information on Hitachi, please visit the company's website at <http://www.hitachi.com>.

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