



# Scaleable Intelligent Video Server System

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<i>Author</i>	Marek Piekarski
<i>Company</i>	Xyratex
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## 1 INTRODUCTION

SIVSS provides a common technology platform for video services and therefore facilitates and expedites the development of standards in the IT, media and convergence arenas. Some of the partners in the project are already active in this area and the deployment of SIVSS is catalysing development and adoption of new, common standards. The SIVSS project specifically contributes to the adoption of new and emerging standards in three areas:

- Communication interfaces
- SATA disk drive enterprise class system requirements setting
- Video server open system architecture

## 2 COMMUNICATION INTERFACES

### 2.1 Advanced Switching Interconnect SIG

Xyratex has been, and continues to be active in a number of ASI-SIG Working Groups. As well as in the umbrella Technical Working Group (TWG), Xyratex is represented in the Profiles, Interoperability, Congestion Management and Fabric Management Working Groups. Xyratex also co-chairs the Storage Working Group.

Specifically, Xyratex has taken a lead on a number of areas which have a direct relevance to SIVSS:

#### 2.1.1 Congestion Management WG

Due to its evolution from the desktop oriented, best effort PCI specification, the original ASI proposal was not well suited to interconnect networks with well defined QoS requirements due to the lack of a suitable fine-grain congestion management mechanism. Xyratex has considerable experience in developing QoS aware fabrics and standards for the communications industry, and was able to lead the ASI standard development in this direction with the inclusion and development of SBFC (Status Based Flow Control). This now enables ASI fabrics such as the Xyratex TeraChannel to provide the end-to-end minimum bandwidth guarantees require by streaming applications.

The original limited Virtual Channel count (4) in the ASI proposal was also considered inadequate. This has now been extended (16) to ensure that multiple flows between pair of endpoints (e.g., real-time video, non-real-time video, control and metadata and fabric management) can isolated and protected from any possible congestion effects under saturating loads.

Both of these features are critical in the professional broadcast application which are a major target of the SIVSS developments.

Xyratex has also been developing a new loss-less multi-stage congestion management mechanism which will enable multistage networks to approach the congestion behaviour of single stage switches in a cost-effective manner. A paper [1] describing this mechanism will be published at HPCA 2005 (14<sup>th</sup> Feb 2005).

### 2.1.2 Fabric Management WG

A major challenge for the ASI-SIG has been to provide the appropriate fabric management mechanisms which will support the plug-and-play ease of use demanded by users of commodity systems, while enabling the high-end enterprise features. As well as developing the standards required, the ASI-SIG been lead to accept that the industry need to be kick-started with an open-source, vendor independent Fabric manager reference implementation.

Xyratex has taken a lead by co-founding with a small number of ASI-SIG members a resourced project (Onondaga Lake) to develop such a reference Fabric Manager. The requirements for this activity have been to some extent driven by the SIVSS requirements to have the Fabric Management capabilities available in mid 2005.

### 2.1.3 Storage WG

Xyratex co-chairs the Storage Working Group at the ASI-SIG. This group and Xyratex in particular, is currently developing a mapping of the T10 SRP-2 SCSI transport layer on to ASI. The requirements of the SIVSS project, as defined in the architecture, are the primary drivers for this activity.

## 3 SATA DISC DRIVE REQUIREMENTS SETTING

Xyratex is active with a number of leading disc drive manufacturers to help define the behaviours and develop the specifications of future SATA drives. The manufacturers have become increasingly aware of the requirement to provide more effective support for media-rich streaming applications, in appliances (set-top boxes), desktop systems and in enterprise systems. Although the high-end SCSI disc drives have been well suited to these applications, the increasing pervasiveness of rich media content is demanding that the more cost effective SATA technology be updated to better handle these real-time, high bandwidth requirements.

Xyratex's focus in these discussions is primarily on the issues of SATA error handling which can cause drives to be unavailable for extended periods of time due to the drive making excessive efforts to recover the corrupted data. Although this was good behaviour in the traditional SATA desktop applications, it is not optimal in a RAID protected, real-time environment. In such a system, the RAID controller can recreate the data on the fly and the disc drive should log the error and move quickly onto the next task.

Xyratex is also directly involved with reviewing changes to manufacturers' drive firmware, again with a view to optimising the drives' queuing and sector reallocation policies to better suit the demands of streaming applications.

## 4 VIDEO SERVER OPEN SYSTEMS

A primary goal of the project is to build fundamental technology building blocks which communicate through open standards. Although not directly influencing the development of those standards, the SIVSS architecture and components have been specified and developed to encourage the adoption of those standards in the video servers market.

## 5 REFERENCES

- [1] *A New Scalable and Cost-Effective Congestion Management Strategy for Lossless Multistage Interconnection Networks* J. Duato, I. Johnson, J. Flich, F. Naven, P. García, and T. Nachiondo