From: June White
Sent: Tuesday, August 17, 1999 9:17 AM
To: Tom Koshy
Subject: FW: SBC initial evaluation of Burstware

---Original Message---
From: Jim Lang
Sent: Monday, August 16, 1999 8:31 PM
To: Frank Schwartz; Jason Boatman
Cc: Frank Vegliante (burst); Kyle Faulkner; June White
Subject: SBC initial evaluation of Burstware

Frank S. and Jason,

Attached is the initial evaluation of Burstware by SBC. From the detail of the report (or lack thereof) is appears that SBC most likely did not conduct a thorough evaluation. I suspect this is due from their work load and lack of business plan and marketing entity business requirements. There are some interesting comments, particularly the last sentence in the conclusion section indicating faster than real time streaming being done by Real and Microsoft.

I committed to John Erickson that we would review, and prepare a response. In my discussion with John, he indicated a willingness to meet with us (our conference bridge) to discuss the test set up, server configuration, etc. He further committed to not release this report within SBC or Ameritech. Please review and lets set up a time to discuss.

Jim Lang

BurstwareEvaluationv2.doc

Memorandum

Burstware Media Server

From: Dinesh Nadarajah, Ahmad Ansari

SBC Technology Resources, Inc.

9505 Arboretum Blvd, Austin, TX 78759

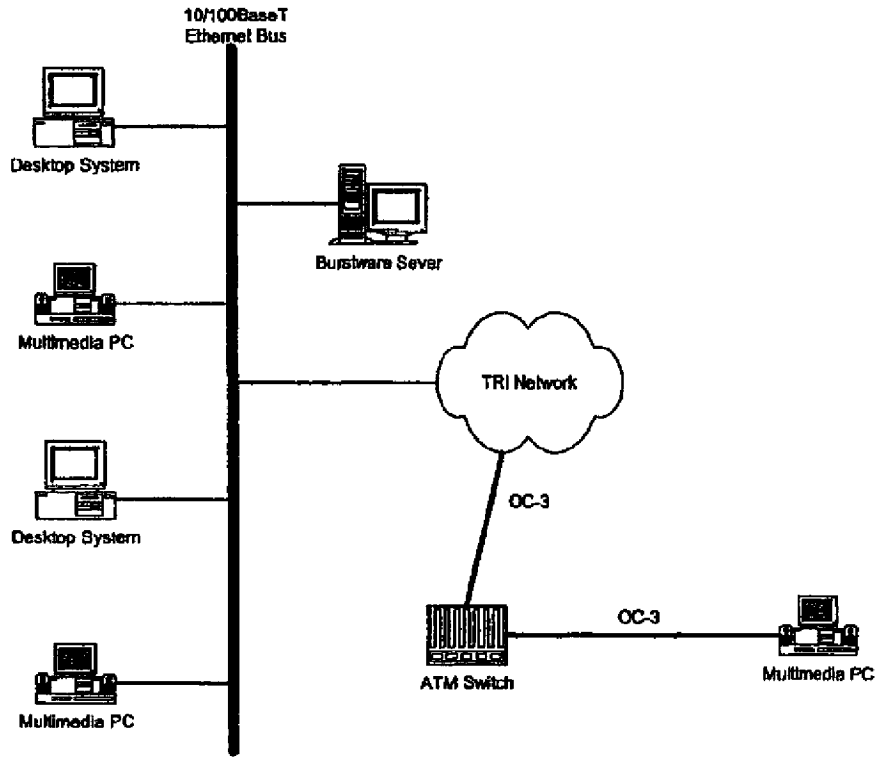
Date: 08/16/99

Introduction

The Burstware video distribution architecture from Instant Video Technologies (IVT) uses faster than real time streaming (FRS) techniques to deliver media content to the desktop. The server can stream many different types of content including MPEG, Quicktime and H.263. Data transport is through the TCP/IP protocol. The product (server and client) was tested in the TRI laboratories and the results are presented in the following pages.

Tested Architecture

The server along with 5 client PCs were employed in the laboratory tests. Four of the PCs were in the same sub-net while the fifth was in a different sub-net. All PCs used in the tests complied with the minimum requirements for the server and client software. The architecture is shown in the diagram below.



Test Observations

The installation of the software, both the client and the server, was quite straightforward. It was primarily a hands off process with only a few instances of path and port entry.

The system was initially tested with a single PC running the Burstware client. The content playback was found to be very "jerky." The PC satisfied all the minimum requirements for a client PC. The client was then installed on a high-end machine (Pentium III - 450MHz). This time the content played back without any jitters or interruptions.

The client and server software appears to have been developed using Java and Java Media Framework (JMF) technologies. Although (complied and) running natively, the client application introduced a fair amount of load on the processor. This affected the playback quality of some MPEG 1 content on some of the low-end machines. There were no problems playing the content using Microsoft's Media Player. The server application was also found to be slow in responding to mouse and keyboard commands. This was not a major issue as the server was not involved in interactive usage (except in monitoring streams and clients).

The client software was installed on five different client PCs to test server load performance. When all five clients were connected to the server, 2-3 clients would freeze content playback, including some of the high end PCs. Some of the client machines were unable to reestablish connections to the server.

Despite being on a low traffic LAN network there were many instances when the buffer would be completely drained and the video content would freeze. There were also many instances of jitter and buffering delays.

The Burstware client had no discernable mechanism to adjust the buffer size. On clients with large amount of disk space, it would be desirable to allocate a large buffer size.

Conclusion

The Burstware faster than real time streaming technology does not seem to offer an advantage over traditional streaming products. Other popular streaming systems seem to also employ some faster-than-real-time methods. FRS technology, to be successful, would require a network connection bandwidth that is at least 3 to 4 times the encoded content data rate and a large buffer.

The results of the testing would seem to indicate that Burstware offers no advantage to SBC services offerings in streamed content. Further refinements in the technology and product may result in a different conclusion, however. FRS has also been incorporated into products by established media streaming products from Real Networks and Microsoft.