

Distributed Systems and Multimedia Processing lab (DSMP)
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(Introduction)

DSMP is a facility which carries out a research program on web performance improvement. The research focus is applied in nature, with strong focus on experimental computer system performance research. The general goals of the research program are: to identify performance problems and bottlenecks in the design and operation of protocols and software in wireless/web-based communication systems; to propose and evaluate creative solutions to these performance problems; and to identify challenges and opportunities for larger-scale deployment of wireless web-based communications infrastructure.

DSMP lab in computer science was funded by collaboration CFI grant which is Infrastructure grant in June 2005 and has become completely operational since summer 2006. The objective of the DSMP lab in computer science department is to collaborate with the similar lab in Department of Electrical Engineering of Ryerson University to provide a state-of-the-art distributed computing grid that is fault-tolerant which will allow the ubiquitous and distributed access and serving of all types of multimedia data to many different types of devices

(Hardware and Software Infrastructure)

Main server Poweredge 4600 Servers

DELL Poweredge server having very high amounts of storage space in RAID configuration with 1000 Mbit/s throughput rate. The server is able to store large video files and images and it can collaborate with multiple servers (for example in Electrical Engineering Department) to be able to test the *distributed* nature of the web. Server is running Linux and provides the backbone to accessing and serving the various types of multimedia data.

OptiPlex GX280 Workstations

3 PC Workstations for development, implementation and verification of algorithms are using in the lab. In addition, each of these workstations will also act as an individual computing node in the overall computing platform.

Portable Computing Equipment

An important aspect of the work and infrastructure requires the investigation of serving multimedia data to different types of devices of varying processing and display capabilities, which may also be connected via a wireless link. To study this, 1 notebook computers, one digital assistant (PDA) are using in the lab. The notebook has fixed and wireless network capabilities and provides a computing node that will have varying network and processing requirements. The PDA is also important since there is a big push today to provide users with multimedia access to devices such as PDAs and mobile telephones. These devices will provide the platform to develop and test algorithms for such an environment. In addition, these wireless portable computing devices will also allow for a more robust look into fault tolerance in wireless environments of different requirements along with providing connection points remote for monitoring and analysis.

ExpertFit and SPSS Statistical Software

As the software component we will use SPSS together with Expertfit (curve fitting software) for statistical analysis that are required for the work load study which is a necessary step to interpret the results of our simulations properly.

Communication Devices: The communication devices such as switches and routers are used to interconnect all the computing nodes and servers. In addition, the switches have ports that can handle varying speeds so that issues of fault tolerance and system reliability can adapt accordingly.

Technical Support: The technical supports for maintaining the lab is providing by computer science department technical and supporting staffs.

(People)

People

The DSMP lab have the following members:

1- Dr. Abdolreza Abhari (Director): Dr. Abhari is assistant professor in computer science department at Ryerson University and has experience in the distributed systems and networking. He has done research on improving the performance of serving regular and multimedia files in the web with focusing on web caching since 1998. He has BSc in computer Engineering, MSc in software engineering and PhD in computer Science. To see more about his research and publications see his web page at www.scs.ryerson.ca/~aabhari

2- Adam Serbinski: Graduate Student

3- Mojgan Soraya: Graduate Student

4- Vahab Akbarzadeh: Research Fellow

5- Niculus A. Lewycky: Graduated Student

6- Miso Gusic: Graduated Student

7- Benjamin Benhan: Graduated Student

(Publications)

- A. Serbinski, A. Abhari, “Improving the Delivery of Multimedia Embedded in Web Pages”, ACM Multimedia, Systems and Networking Track (short paper), Augsburg, Germany, September 2007
- A. Abhari, M. Soraya, “Workload Characterization for the Multimedia Files Embedded in the Popular Web Pages” , In Proceedings of International Conference on Internet and Multimedia Systems and Applications (IMSA 2007), Honolulu, USA, August 2007
- A, Serbinski, A. Abhari, “Improving the Delivery of Multimedia in HTML over HTTP on Wireless Network”, In Proceedings of Third International Mobile Multimedia Communications Conference (MobiMedia 2007), Nafpaktos, Greece, August 2007
- Abhari, A. Serbinski, M. Gusic, ”Improving the Performance of Apache Web Server”, In ", In Proceeding of 10th Communications and Networking Simulation Symposium (CNS07), Norfolk, VA., USA, April 2007
- N. A. Lewycky, B. M. Benhan, A. Abhari, "Improving the Performance of the Squid Proxy Cache", In Proceeding of 9th Communications and Networking Simulation Symposium (CNS06), Huntsville, AL., USA, April 2006

(Products)

Name	Purpose	Possible Interested Companies in industry	Status
Modified Squid	improved Squid proxy cache based on open source Squid proxy cache software	ISPs, regular users and companies who want to increase the faster page load access time	ready
Modified Apache	improved Apache web server based on open source Apache web server software	content providers or companies who want to provide the faster access to their web sites	ready
Custom web server	simple and easy to use web server written from the scratch	companies with their own Intranet	ready
Web page generator	workload generator that can be used for the web server benchmarking and testing	content providers	ongoing project
Multimedia caching	improving the performance of serving multimedia files for wired and wireless web access	multimedia content providers , and companies who want to provide better wired or wireless access to web for their clients	ongoing project
Multimedia simulator	testing and benchmarking serving of multimedia files in the web	multimedia content providers , and companies who want to provide better wired or wireless access to web for their clients	ongoing project

(Contact Information)

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