

Web Computing: An Introduction

Matthew N. O. Sadiku¹, Adebowale E. Shadare¹, and Sarhan M. Musa²

¹Department of Electrical/Computer Engineering, ²Engineering Technology, Prairie View A&M University
Email: sadiku@ieee.org; shadareadebowale@yahoo.com; smmusa @pvamu.edu

Abstract – *Web computing is computing enabled by and situated on the web. It involves accessing a machine that is somewhere connected to the Internet to process some data and obtain results. It is based on a client/server model. The main objective of web computing is to perform CPU intensive tasks by outsourcing the computations to external clients. This paper provides a brief introduction to web computing.*

Keywords: web computing, web-based computing

I. INTRODUCTION

Over the years, the web has grown into a platform for people-centric one-to-one and many-to-many communication and collaboration. With the appearance of Java programming language, the dream of global distributed computing has become a reality.

The web supports pervasive, non-desktop computing that is accessible in a large number of places.

Web computing allows a host with limited resources to perform compute-intensive tasks by outsourcing the computations to external clients. It is a modality of collaborative (parallel and distributed) computing wherein enormous volunteers register at a website.

Each volunteer visits the website on a regular basis to receive a task to compute. After completing the task, the volunteer returns the results from that task and receives another task. And the cycle continues.

Web computing is a special kind of cloud computing in which computations are distributed across the clients. The goal of web computing is to make computing resources, both hardware and software, available on the web to provide collaboration over the web [1]. The modern development environment for web computing includes web servers, HTTP, HTML, Java programming language, Java-enabled browsers, object-oriented databases, and other web-oriented protocols. Web computing has introduced a major change in programming. To support all phases of Internet-enabled software development, entirely new environments need to be created [2].

II. APPLICATIONS

Web-based applications offer some unique advantages—sharing, low risk of data loss, wide accessibility, and collaboration—that are too attractive to ignore [3]. Web computing enables collaboration over the Internet. The collaboration enables a large range of complex computations to be handled efficiently by outsourcing [4].

The web computing plays a major role in enabling healthcare services like telemedicine to serve inaccessible areas where there are few medical resources [5]. It serves as a solution to

current problems in informatics such as distributed computation, algorithm delivery, and data visualization [6].

III. CHALLENGES

Every major computing technology has created significant new challenges even while enabling new levels of computational efficiency. One potential danger with web computing is its inherent insecurity. Another major challenge is how to guarantee the integrity of the results when the computation is outsourced [7].

IV. CONCLUSION

Web computing is a type of distributed computing that involves Internet-based collaboration of several remote programs. Communication facilities on the web are crucial in designing and implementing distributed systems for cooperation purposes.

Since computing is embedded into every facet of modern life, it is crucial that students of all majors are educated about the working and impact of web computing. There should be some general education courses in web computing for engineering, computer science, and other students [8].

Advances in web computing guarantee a better support of human communication over wider distances than it is currently feasible.

REFERENCES

- i. A. L. Rosenberg, "Accountable web-computing," *IEEE Transactions on Parallel and Distributed Systems*, vol. 14, no. 2, February 2003, pp. 97-106.
- ii. N. B. Serbedzija, "Web computing in theory and practice: an introduction to the Minitrack," *Proceedings of the Thirty-First Hawaii International Conference on System Sciences*, January 1998, pp. 602-603.
- iii. H. Shen, Z. Yang, and C. Sun, "Collaborative web computing: from desktops to webtops," *IEEE Distributed Systems Online*, vol. 8, no. 4, April 2007, pp. 1-4.
- iv. N. B. Serbedzija, "Web computing framework," *Journal of Systems Architecture*, vol. 45, 1999, pp. 1293-1306.
- v. I. Hababeh, I. Khalil, and A. Khreishah, "Designing high performance web-based computing services to promote telemedicine database management system," *IEEE Transactions on Services Computing*, vol. 8, no. 1, Jan/Feb. 2015, pp. 47-64.
- vi. S. R. Wilkinson, "Web computing for bioinformatics applications," *Doctoral Dissertation, University of Alabama at Birmingham*, 2015.
- vii. S. Wong, "An authentication protocol in web-computing," *Proceedings of 20th IEEE International Parallel & Distributed Processing Symposium*, 2006.
- viii. C. J. Romanowski, R. K. Raj, and M. Kwon, "Work on progress - An immersion course concentration in mobile web computing," *Proceedings of 41st ASEE/IEEE Frontiers in Education Conference*, Rapid City, SD, October, 2011.



About The Authors

Matthew N.O. Sadiku is a professor at Prairie View A&M University, Texas. He is the author of several books and papers. He is an IEEE fellow. His research interests include computational electromagnetics and computer networks.

Adebowale Shadare is a doctoral student at Prairie View A&M University, Texas. He is the author of several papers.

Sarhan M. Musa is a professor in the Department of Engineering Technology at Prairie View A&M University, Texas. He has been the director of Prairie View Networking Academy, Texas, since 2004. He is an LTD Spring and Boeing Welliver Fellow.