

Nomadic Computing: A Primer

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ABSTRACT

The wide availability of mobile devices has enabled us to conduct our personal computing and communications activities on the go. Consequently, we are fast becoming a community of nomadic computer users. Nomadicity is an emerging technology. Nomadic computing is the use of mobile devices to connect to computer network such as the Internet while mobile. It extends the office to employees on-the-go. This paper provides a brief introduction to nomadic computing.

KEYWORDS: nomadic computing, mobile computing, ubiquitous computing

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INTRODUCTION

Historically and traditionally, nomadism was the way of life of people who did not continually live in one place but move from place to place, mainly for the reasons of survival. The proliferation of mobile devices and wireless has increased the possibility of people to access their preferred services anywhere at any time. It is now recognized that access to computing and communications is necessary to the nomads moving from place to place. Nomadicity is an emerging technology that already surrounds the users. It manifests itself as users travel to many different places and carry with them their laptops, personal digital assistants (PDAs), cellular telephones, pagers, and so on [1]. A typical illustration of nomadicity is shown in Figure 1 [2].

Nomadic computing, also known as mobile computing, is the ability to perform computing services from anywhere, anytime, and with an unlimited number of mobile devices. It draws from many disciplines such as wireless communications, mobile technology, positioning technologies, micro-electro-mechanical systems (MEMS), and nanotechnology.

CONCEPT OF NOMADIC COMPUTING

The main characteristics of nomadicity include independence of location, motion, computing platform, communication device, and access to computers and communication devices. The essence of a nomadic environment is being able to automatically adjust to user's

computing and communication needs in a transparent manner as one moves between office, home, airplane, hotel, automobile, branch office, and so on [3].

Nomadic computing relies on a number of key technologies that have allowed people around the world to access shared resources from nearly anywhere. These include the Internet, wireless network, high-powered mobile devices, encryption, and security protocols for remote access. Encryption is often used to ensure the privacy of transmitted information over public networks.

Nomadic computing may utilize a wired or wireless network. Nomadicity arises whether or not there is access to wireless communications. Access to wireless communications allows the nomad to communicate while roaming. With the dramatic advancements in mobile technology, the vast majority of users can perform the same tasks on their mobile devices as they traditionally performed on their PC or laptops. Mobile devices include notebook PCs, tablets, and smart phones. With increased processing power and memory, the mobile devices are gradually approaching desktop computers. The small portable communication devices constitute an integral component of nomadic computing systems. Wireless networking has now made it possible to exchange real time information from any mobile device from everywhere in the globe.

Those technologies are overview of what kind of possibilities that is available to support a nomadic computing environment.

Concepts like pervasive and ubiquitous computing suggest radically new types of computing based on users' nomadic behaviors. Relationship between computing is shown in Figure 2 [4]. The applications of mobile/nomadic computing have become ubiquitous and pervasive in business, consumer, industry, and entertainment.

BENEFITS AND CHALLENGES

The most remarkable benefit of nomadic computing is the flexibility and the independence of environment. Nomadic computing has a huge potential for improved capability and convenience for the user. It enables for the user's dynamically changing computing and communications environment. It is capable of driving user adoption of mobile technology and creating business opportunity. It allows people to be connected 24/7 with mobile commerce worldwide. It has the potential to make significant improvements to the transportation process. Cultivating nomadic culture creates an effective environment in which workers can work anytime anywhere. This nomadic behavior tends to yield positive results for the company [5].

Nomadcity presents a problem in interoperability at many levels. The nomads accessing the network via wireless links will contend with limitations of the wireless networks or un tethered communications. A major concern with nomadic computing is the relative scarcity of bandwidth on wireless networks. The nomad often discovers that the computing and communication devices are outside the careful security walls of the home organization. This leads to the issue of security, which involves privacy as well as authentication. Trust depends on security, which is why security is important in nomadic computing. Competition is a major obstacle to sharing services and information. There is also the potential for abuse. Prevention of impersonation of one device by another is problematic. When a mobile device is taken away from its local environment, the data it sends and receives are subject to theft and to unauthorized copying [6].

CONCLUSION

Nomadic computing (or anywhere, anytime computing) addresses the problem of nomadcity, which refers to the use of software application services independent of location, motion, time, and application platform. Nomadcity can support computing and communication services for nomads as they travel in a transparent and convenient way [7]. Nomadic computing is being able to communicate on anytime anywhere basis. It is increasing and becoming more and more common today as the way people live is changing. It is a rapidly evolving technology. It is the way computing will be done in the future.

REFERENCES

[1] "Nomadic computing and communications," National Research Council. *The Unpredictable Certainty*: White

Papers. Washington, DC: The National Academies Press, 1997.

[2] "Nomadic computing with mobile devices," 2013, <https://www.cognizant.com/perspectives/nomadic-computing-with-mobile-devices>

[3] L. Klein rock, "Nomadic computing" <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.78.6287&rep=rep1&type=pdf>

[4] P. D. Dudhe and P. L. Ramteke, "Mobile computing with wireless LAN and its modes ad hoc network with challenges," *International Journal of Computer Science and Mobile Computing*, vol.3, no. 4, April- 2014, pp. 671-676.

[5] L. Chen and R. Nath, "Nomadic culture: Cultural support for working anytime, anywhere," *Information Systems Management*, vol. 22, no. 4, Fall 2005, pp. 56-64.

[6] R. Alonso and H. F. Korth, "Database system issues in nomadic computing," <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.88.9253&rep=rep1&type=pdf>

[7] J. Bonander and M. Wang, "Nomadic computing towards secure cargo transports," *Master Thesis in Informatics*, 2004.



Figure 1. A typical illustration of nomadcity [2]

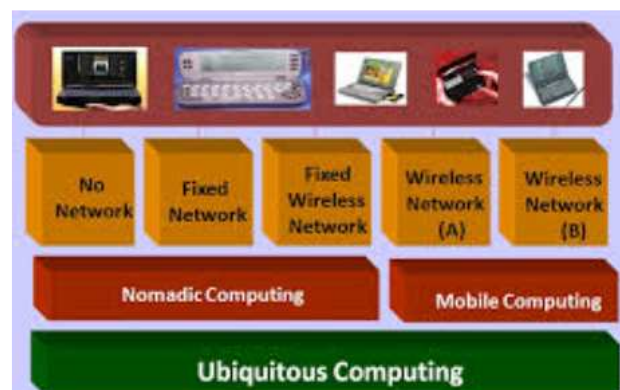


Figure2. Relationship between nomadic, mobile, and ubiquitous computing [4]