Chapter 6
Software in Amateur “Packet Radio” Communications and Networking

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ABSTRACT
In modern (amateur radio) wireless communications, we use computers. Depending on particular situations, such as employers’ and personal preferences, users can adopt more or less proprietary operating systems and related end-user programs. In emerging and developing societies, the usage of proprietary software can be costly. Not only that, contrary to so-called “open” software, the “closed” software is not able to motivate its users to upgrade those programs regularly, not only because of high prices and restricted licensing policies, but also because of its nature, which is the “closedness” of program codes, where the end-users are not allowed to change programmed software, and so assist companies in improving features of their software products. Therefore, the authors help prospective newcomers in the amateur wireless communications to become familiar with the “open” software and, as well, to encourage them in implementing many “free” software solutions at home or work.

INTRODUCTION
Most of the time, somebody of us spends money on purchasing new computer hardware. Regardless the type of consumers we are—individual citizens, or schools and companies where we study or work—ICT markets constantly push us and other prospective buyers into replacing our technical equipment in order to, among the others, adopt a newer operating system (OS), or user programs or computing procedures. Every so often, the new versions of our programs are no more capable to run on existing hardware. Even though our computing machines might not be obsolete enough so that they had to be replaced with brand new models, in many occasions software trends succeed initiating new purchases. For example, popular operating systems produced by
Microsoft™ are well known as ‘hardware-hungry’ environments, which means that any new member of the Windows OS family requires better (read: newer generation of) computer hardware. But that is not all. Some producers of computer programs for Microsoft Windows operating systems do not preserve backward compatibilities with previous versions of that OS, hence the new program features often require installing newer versions of Windows that, in turn, requires new hardware, and so on. Sometimes the differences between various versions of an operating system and related end-user programs are so significant that it is not easy to recognize where the ‘upgrade’ actually is: Is it in the users program itself, or in a specific characteristics of an OS, or it is maybe in a new hardware specification. The final question might be: Is it all worth the upgrade and would not be better if a user could continue with his or her existing hardware and software solutions—without investments in new equipment and without having losses in productivity during periods of those mostly time-consuming upgrades. In the first part of this chapter we are going to elaborate recent advances in some amateur radio software for Microsoft-based ‘packet-radio’ node installations, where computer hardware and the operating system are seemingly going toward the end of their lifecycle (considered as a hardware + software combination). After that, we will discuss some feasible alternatives for non-Microsoft environments that, in turn, ensure the prolonged usage of the same hardware, and in addition to save the customers from spending money on purchasing new licenses for operating system upgrades.

Background

Amateur radio is an old hobby. Having in mind that most of its practitioners and wireless enthusiasts have been always keen on spending money for real technical equipment, such as radio transmitters, antennas, power supplies, and grounding installations, it is for sure that they mostly practiced to save finances by avoiding unnecessary expenditures in non-primary but expensive purchases. An example of such accessory are computers dedicated for supporting amateur radio activities, such as logging wireless correspondence or calculating distances and contest results. In most cases, average computers of older generations, such as Amiga™, Atari™, Commodore™, as well as the first generations of Intel™-based machines, satisfied all those needs. Particularly, whenever such computers have not been used for more complex operations at either home or work, everything is fine. In addition, the mentioned computer brands and types also satisfy basic needs in digital amateur radio communications, such as ‘packet radio’. Although that simple computer-related amateur radio mode is often wrongly considered as a low-cost replacement for commercial wireless services—particularly in urban city zones, it is a valuable learners’ tool for prospective wireless communicators and educational institutions in rural areas and remote locations with no other types of wireless connectivity (Skoric, 2009). By implementing ‘packet radio’ at its premises, a school can establish an AMUNET, the experimenting wireless network for their students, parents, and teachers.

To start exploring amateur wireless communications and networks, you do not need to obtain brand new computers and newest versions of MS Windows (though nobody is going to stop you from doing that). Instead, you can build your own version of the operating system based on Linux, and save a lot of money. To be precise, by rebuilding the core of Linux, its kernel, you are able to “eliminate the device drivers that you don’t need … [and] … reduce the amount of memory used by the kernel itself” (Welsh & Kaufman, 1995, p. 162). As a result, you will have your system software to be perfectly ‘tailored’ to satisfy your computer hardware’s expectations. As Komarinski and Collett (1998) state “Linux gives you things that Windows … can only dream about … [such as] … source code for the entire kernel … [or] … full configurability of the operating system … [or]