

Specially configured personal computers (PCs) using stock-component hard drives (HDs) constitute a critical component of modern radiotherapy systems. The control programs stored on these HDs are susceptible to failure by several methods, including mechanical HD failure, viruses, and user error. Backup of these critical HDs is desirable; however, the installation of third-party software or hardware to these treatment device PCs is prohibited, as well as costly. We present an efficient backup solution consisting of a portable Linux-based fileserver ("clone server") which we have used to store bit-by-bit images ("clones") of all critical HDs in our department. Networked backups are executed by booting the target PC with a bootable Linux distribution, which loads the Linux operating system (OS) into RAM until rebooting; the bit-by-bit contents of the HD are sent over the network to the clone server. Direct backups are executed by connecting the target HD directly to the clone server motherboard and copying. Regardless of which of these techniques is used, we show that the act of creating the clone file does not change the data on the cloned HD. Restoration of a failed HD consists of attaching a new HD to the clone server, copying the previously obtained clone file to the HD, and installing the HD into the failed PC, a process that takes about 1 hour. These tools and techniques form a basis for PC QA, as they dramatically reduce the negative impact of data loss and PC failure.