Chapter VI
Design of a Filmless Hospital

INTRODUCTION

More rapidly than any technological advance in medical history, filmless hospital is changing the clinical and business aspects of radiology practice by delivering substantial cost savings, improved efficiency and quality, and greater access in an era of high demand and severely constrained resources. Systems are available in many variations, from mini-PACS to hospital-wide or enterprise-wide PACS. However, among the variations, the basic structure of a PACS is similar as shown in Figure 1.

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Computer Network Within A Hospital (Local Area Network)

In most cases the local area network (LAN) for image transfer is better to be isolated from the hospital network. This is not saying that there is no inter-communication because there must be a bridge between the two. The radiology imaging network must function independently of all other networks. The image network can’t af
ford to compete for space on any other information network that will not only slow down but could shut down.

Today, three types of computer network are used in a hospital for PACS. They are fast Ethernet, gigabit Ethernet, and optical fibre.

Fast Ethernet is a collective term for a number of Ethernet standards that carry traffic at the nominal rate of 100 Mbit/s, against the original Ethernet speed of 10 Mbit/s. Of the 100 megabit Ethernet standards 100baseTX is by far the most common and is supported by the vast majority of Ethernet hardware currently produced. Full duplex fast Ethernet is sometimes referred to as “200 Mbit/s” though this is somewhat misleading as that level of improvement will only be achieved if traffic patterns are symmetrical. Fast Ethernet was introduced in 1995 and remained the fastest version of Ethernet for three years before being superseded by gigabit Ethernet.

Gigabit Ethernet is a term describing various technologies for transmitting Ethernet frames at a rate of a gigabit per second, as defined by the IEEE 802.3-2005 standard. Half duplex gigabit links connected through hubs are allowed by the specification but in the marketplace full duplex with switches is the norm.
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