

Information about the company

Property, plant and equipment

The Netherlands

Telecommunications services depend on a core network for the transfer of data or voice information. The ongoing growth in bandwidth and services requires continuous development in design and capabilities. KPN's existing fixed and mobile infrastructures and its future plans are described hereafter.

Fixed Infrastructure

Access networks

KPN's access network in The Netherlands basically consists of twisted pair copper reaching nearly all of the eight million Dutch households with two pairs of copper wires in the access network.

Despite the continuing migration to mobile-only solutions, over 60% of Dutch households were actively connected to KPN's access network as of December 31, 2007.

On December 31, 2007, 251 CityRing areas (in 107 concentration points) and about 794 other access areas form KPN's fiber access network. Fiber access permits transmission rates in excess of 155 Mb/s. KPN's fiber network is partly upgraded to 1 Gb/s and 10 Gb/s C/DWDM/Ethernet technology in order to offer services to large enterprises.

In certain cases, wireless transmission systems are used in KPN's access network (as back-up or if fiber access is not available). At HotSpot locations, broadband Internet access is provided through WiFi. By the end of 2007, over 900 HotSpot locations were operational in The Netherlands. In co-operation with NS (Dutch Railways), KPN operates WiFi HotSpots in major railway stations. In 2006, KPN HotSpots acquired Attingo B.V., the only provider of public Internet and business communications services at Amsterdam Airport Schiphol. With the acquisition of Enertel in 2006, KPN also acquired Enertel Wireless B.V. Enertel Wireless, operating 150 HotSpots and fully integrated it into KPN's HotSpots network in 2007.

Backbone networks

KPN's backbone networks support voice, video and data traffic between access points. The backbone networks can be divided in the 'Lambda' dense wavelength division multiplexing network (fiber optic backbone), the 'Hirka' synchronous digital hierarchy network (traditional backbone), dedicated service-related networks and several long-distance CityRings (fiber).

The average usage levels of these networks are summarized in the following table:

Average usage level	2007	2006	2005
Lambda DWDM	86%	85%	72%
Hirka SDH	70%	68%	69%
CityRings	20%	20%	18%

The traditional backbone has a maximum network capacity of 155 Mb/s. To accommodate the fast growing demand for high-speed transmission (defined as 155 Mb/s and up), KPN built the fiber-optic "Lambda" network with SDH and DWDM-based transmission technology. This fiber optic network became operational in 2000. By the end of 2007, about 220 locations were interconnected by 10 Gb/s transmission routers and 740 locations by 2.5 Gb/s transmission routers. Each of the access areas is connected to the transmission backbone network at two separate locations to ensure continuity.

The development and rollout of cost-efficient networks relies on the technically advanced multi-protocol label switching (MPLS) infrastructure, which is based on fiber techniques and suitable for advanced DSL and IPTV services. This MPLS infrastructure is fully integrated in KPN's Ethernet network and builds upon the Lambda network, interconnecting various MetroRings across the country using 1 Gb/s and 10 Gb/s fiber-optic infrastructures. Moreover, this core infrastructure is used to interconnect regional Ethernet and IP access nodes.

Service layers of the fixed infrastructure

The service layers built on KPN's core infrastructure networks in The Netherlands comprise switched voice, video and data network services. Service edges connect the access network to KPN's backbone networks.

Voice networks

KPN's public switched telephony network (PSTN) and ISDN networks in The Netherlands consist of approximately 1,328 local exchanges and 2 x 20 trunk exchanges connected by a long-distance transmission network. KPN's network is also connected to other operators' networks. The telephony networks are designed and engineered to have general availability with internal blocking and outages during peak hours below 1% end-to-end, measured on a yearly basis.

Data networks

The switched data networks consist of frame relay (FR) and asynchronous transfer mode (ATM) networks and of Ethernet.