Layering:

**Application**:

.client-server: HTTP, DNS, SMTP

.peer-to-peer: Gnutella, Bittorent, DHT

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**Session Layer**，OSI参考模型的第五层。负责在网络中的两节点之间建立、维持和终止通信。

**Presentation Layer**，OSI参考模型中的第六层.管理数据的解密与加密，如系统口令的处理。

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**Transport**: [传输协议](http://baike.baidu.com/view/441895.htm)同时进行[流量控制](http://baike.baidu.com/view/190232.htm)或是基于接收方可接收数据的快慢程度规定适当的发送速率。

.end-to-end data delivery service

.TCP, UDP, SCTP

**Network**: 其主要功能是将[网络地址](http://baike.baidu.com/view/547479.htm)翻译成对应的[物理地址](http://baike.baidu.com/view/883168.htm)，并决定如何将数据从发送方[路由](http://baike.baidu.com/view/18655.htm)到接收方。

.Router 在这一层

Forwarding packets from source host to the destination host

.forwarding: send packets to the next hop router

.routing: compute the next hop for each destination

.routing algo & protocol:

.Distance Vector: RIP

.Path Vector: BGP

.Link State: OSPF

.Best effort and QoS

**Datalink: Switch(mac address)**

**.**Functions:

.framing, error detection & correction, access sharing

.e.g.:

Dialup,

DSL, DSL的中文名是数字用户线路，是以电话线为[传输介质](http://baike.baidu.com/view/305337.htm)的传输技术组合

Cable modem,

Wifi, CDMA, GSM

**Physical: Hub**

.Transmit bits on physical media

.bandwith

ARP(Address Resolution Protocol):获取物理地址的一个TCP/IP协议。

Retrieve a web page过程：

1. DNS name lookup
2. Establish TCP connection
3. Send/receive IP packets to/from default router. The default router will figure out how to forward the packets towards the destination.
4. Translate IP address to Ethernet address via ARP.
5. Send/receive Ethernet frames.

ISP: Internet service provider

Internet routing Hierarchy:

AS (Autonomous System):a collection of routers under the same technical and administrative control.

•EGP (External Gateway Protocol):for inter-domain routing, e.g. BGP

•IGP (Internal Gateway Protocol):for intra-domain routing, e.g. RIP, OSPF