**Learning Objectives**

* To learn about client and server;
* To learn about IP address;
* To learn about domain;
* To learn about protocol;
* To learn about URL.

**Learning Contents**

* **What is an Internet?**
  + Imagine how roads around the world are interconnected with each other: local roads connect with city roads, city roads connect with provincial and national roads and national roads connect with international roads. Through such a road network, we drive from our home to anywhere else in the world. And you will find there is not a center in the road network.
  + Internet works in the same way. Instead of being a road network, it is a cable network; instead of connecting one home with another, it connects a computer with another. And what run on the Internet are not cars but various information.
  + Internet was invented in the year of 1969 to interconnect computers around the United States. To date, billions of devices (including personal computers, notebooks, mobile phones, TVs, refrigerators and so forth) have been interconnected with each other through the Internet.
* **What is a client? What is a server?**
  + Normally communication on the Internet is made between two computers:
  + The terminal holding data is often called a server;
  + The terminal demanding data is often called a client.
  + Client exists in different forms, e.g.:
  + A web browser (IE, Edge and Chrome);
  + An email client (Foxmail, Outlook);
  + A social application (WeChat).
  + The above programs obtain data (website, email or message) from the server. Although the clients send messages to the server sometimes, the clients do not store these messages but the server stores them.
  + The server is normally a dedicated computer which is always connected with the Internet. Its sole purpose is to provide data.
  + Although any device connected with the Internet might be a client and a server simultaneously, most devices we use are regarded as a client as normally we only obtain data from it and do not store any data on it.
* **What is an IP address?**
  + Just as every house has a special and unique house number, every computer connected with the Internet is assigned with a specific IP address so that it can be identified on the whole Internet.
  + An IP address is normally a combination of 4 numbers: 121.23.199.146.
* **What is a domain?**
  + Although IP address is the unique address used to identify computers, they are unique and relatively complicated, so it’s hard for people to read and remember it directly.
  + Then in 1985, domain was invented to link the numerical IP address like 121.23.199.146 with texts containing baidu.com. Hence, they are interchangeable. By visiting either [https://121.23.199.146](https://121.23.199.146/) or [https://baidu.com](https://baidu.com/), we may log in the identical website eventually.
  + A domain is normally composed of three parts. Specifically they are from right to left:
  + Top level domain: It contains general top level domain (.com, .org and .net) and country-specific domain (.cn, .us, .nl and .fr);
  + Domain: it is a name like baidu, and may contain letters and numbers but does not contain spaces or dots.
  + Sub-domain (optional): Sub-domain is optional, but most websites use www as a default sub-domain. Sometimes sub-domain is used to identify contents of a webpage. For instance, image.baidu.com is the domain of baidu images.
  + A domain can be also regarded as naming of computer. After a computer is such named and connected with the Internet, it is more convenient for users to visit.
* **What is a protocol?**
  + The purpose of interconnecting computers on the Internet is to make these computers communicate with each other. Just as human beings communicate with all kinds of languages, computers communicate with protocols on the Internet.
  + Different protocols have different purposes:

Protocol Name Purpose Year of Invention TP File transmission 1971 MTP Email sending 1971 MAP Email receiving 1986 RC Chatting 1988 TTP Webpage browsing 1989

* **What is a URL?**
  + So far we have introduced domain and computer network protocol. Now we can create a URL (Uniform Resource Locator).
  + For example, URL of Baidu is <https://www.baidu.com/index.html>, which can be divided into 3 parts:
  + https:// is the protocol;
  + www.baidu.com is the domain;
  + /index.html is the path name;
  + Each URL is unique and defines which protocol should be used to read it (https://) and where we read it (www.baidu.com/index.html).
  + Sometimes URL seems more complicated. We will continue to study and learn about the more complicated content in subsequent studies.

**Recommended Resources**

* What is a Domain? (<https://developer.mozilla.org/en-US/docs/Learn/Common_questions/What_is_a_domain_name>)
* Introduction to Internet Protocol (I) (<http://www.ruanyifeng.com/blog/2012/05/internet_protocol_suite_part_i.html>)
* Introduction to Internet Protocol (II) (<http://www.ruanyifeng.com/blog/2012/06/internet_protocol_suite_part_ii.html>)