物联网专业英语

Specialized English in Internet of Things

谷学静　王志良　郭宇承　主编

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本书体系完整、内容详实，介绍了物联网的由来以及物联网技术结构、传感器、射频识别、无线传感器网络、M2M、云计算和物联网安全等基本技术，分析了物联网的发展趋势，最后引用智慧地球、智慧城市、智能家居、智能产业等领域的具体案例对上述技术进一步进行讲解说明。课文配有手绘插图，帮助读者理解课文内容，并带给读者愉悦的阅读体验，从而提高读者的学习兴趣。每篇课文后均配有生词、短语、缩略语、注释及习题，用以巩固对课文的理解。课后附有参考译文及练习参考答案，可供教师及学生学习参考之用。

本书不仅可以作为高等院校物联网及相关专业的专业英语教程，还可以作为广大信息技术爱好者学习物联网的教材或参考书。

前　　言

物联网是把互联网延伸到物的层面，在信息技术行业中成为继计算机、互联网之后的第三次技术革命。物联网比互联网涵盖的技术更丰富、发展前景更广阔。目前，我国物联网已经进入高速发展期，许多科研院所都投入了大量的人力和物力来推动其发展，多数高校也开设相关专业来培养急需的专业人员。由于物联网有极高的发展速度，从业人员必须掌握许多新技术和新方法，而新技术大多来源于欧美，因此对专业英语的要求较高；专业英语是技术人员在本行业中获得成长和发展的重要工具。

为了保证本书的先进性和实用性，教材中所有的文章均出自国外最近几年物联网领域的最新教材、专著及国际著名组织、公司、网站提供的技术应用文章（详见参考文献）。书中许多内容不仅实用，而且全面，充分体现了物联网当下的发展热点及趋势。在具体内容的选材上，既考虑了知识的基础性和系统性，使学生能够利用既有专业知识理解课文内容，同时也选择了部分拓展性的文献以开阔视野并加深对相关基础内容的理解。

本书体系完整，共由三个单元（15 篇课文）组成。第 1 单元为综述篇，包括互联网简史、电子信息技术简介及物联网概论；第 2 单元为技术篇，内容为物联网技术结构、传感器、射频识别、无线传感器网络、M2M、云计算和物联网安全；第 3 单元为应用篇，涵盖智慧地球、智慧城市、智能家居、智能产业和物联网具体应用举例。

教材课文均配有译文，课后习题量适当，难易搭配，便于教师组织教学。

本书由谷学静、王志良、郭宇承主编，负责本书全部内容的组稿、统稿和修订工作。第 1 单元由河北联合大学谷学静、高建宇、邢玉秀编写，第 2 单元由北京科技大学王志良、谷学静编写，第 3 单元由谷学静、王志良、高建宇编写。本书全部插图由河北联合大学郭宇承手绘创作。

由于水平所限，书中难免有纰漏和欠妥之处，请各位读者不吝赐教。

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编　者
2015 年 1 月

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目　　录

Unit 1 Introduction to Internet of Things (IoT)

Lesson 1 History of Internet in a Nutshell

Here's a brief history of the Internet, including important dates, people, projects, sites, and other information that should give you at least a partial picture of what this thing we call the Internet really is, and where it came from.

While the complete history of the Internet could easily fill a few books, we should familiarize you with key milestones and events related to the growth and evolution of the Internet between 1969 to 2009.

1969: Arpanet

Arpanet (Advanced Research Projects Agency Network) was the first real network to run on packet switching technology (new at the time). On the October 29, 1969, computers at Stanford and UCLA[1] connected for the first time. In effect, they were the first hosts on what would one day become the Internet.

The first message sent across the network was supposed to be "Login", but reportedly, the link between the two colleges crashed on the letter "g".

1969: Unix

Another major milestone during the 1960s was the inception of Unix: the operating system whose design heavily influenced that of Linux and FreeBSD[2] (the operating systems most popular in today's web servers/web hosting services).

1970: Arpanet network

An Arpanet network was established between Harvard, MIT, and BBN (the company that created the "interface message processor" computers used to connect to the network) in 1970.

1971: Email

Email was first developed in 1971 by Ray Tomlinson, who also made the decision to use the "@" symbol to separate the user name from the computer name (which later on became the domain name).

1971: Project Gutenberg and eBooks

One of the most impressive developments of 1971 was the start of Project Gutenberg. Project Gutenberg, for those unfamiliar with the site, is a global effort to make books and documents in the public domain[4] available electronically—for free—in a variety of eBooks and electronic formats.

It began when Michael Hart gained access to a large block of computing time and came to the realization that the future of computers wasn't in computing itself, but in the storage, retrieval and searching of information that, at the time, was only contained in libraries. He manually typed (no OCR[5] at the time) the "Declaration of Independence" and launched Project Gutenberg to make information contained in books widely available in electronic form. In effect, this was the birth of the eBook.

1972: CYCLADES

France began its own Arpanet-like project in 1972, called CYCLADES. While CYCLADES was eventually shut down, it did pioneer a key idea: the host computer should be responsible for data transmission rather than the network itself.

1973: The first trans-Atlantic connection and the popularity of emailing

Arpanet made its first trans-Atlantic connection in 1973, with the University College of London[6]. During the same year, email accounted for 75% of all Arpanet network activity.

1974: The beginning of TCP/IP

1974 was a breakthrough year. A proposal was published to link Arpa-like networks together into a so-called "inter-network", which would have no central control and would work around a transmission control protocol (which eventually became TCP/IP).

1975: The email client

With the popularity of emailing, the first modern email program was developed by John Vittal, a programmer at the University of Southern California in 1975. The biggest technological advance this program (called MSG) made was the addition of "Reply" and "Forward" functionality.

1977: The PC modem

1977 was a big year for the development of the Internet as we know it today. It's the year the

first PC modem, developed by Dennis Hayes and Dale Heatherington, was introduced and initially sold to computer hobbyists.

1978: The Bulletin Board System (BBS)

The first bulletin board system (BBS) was developed during a blizzard in Chicago in 1978.

1978: Spam is born

1978 is also the year that brought the first unsolicited commercial email message (later known as spam), sent out to 600 California Arpanet users by Gary Thuerk.

1979: MUD – The earliest form of multiplayer games

The precursor to World of Warcraft and Second Life was developed in 1979, and was called MUD (short for MultiUser Dungeon). MUDs were entirely text-based virtual worlds, combining elements of role-playing games, interactive, fiction, and online chat.

1979: Usenet

1979 also ushered into the scene: Usenet, created by two graduate students. Usenet was an internet-based discussion system, allowing people from around the globe to converse about the same topics by posting public messages categorized by newsgroups.

1980: ENQUIRE software

The European Organization for Nuclear Research (better known as CERN) launched ENQUIRE (written by Tim Berners-Lee), a hypertext program that allowed scientists at the particle physics lab to keep track of people, software, and projects using hypertext (hyperlinks).

1982: The first emoticon

While many people credit Kevin MacKenzie with the invention of the emoticon in 1979, it was Scott Fahlman in 1982 who proposed using :-) after a joke, rather than the original -) proposed by MacKenzie. The modern emoticon was born.

1983: Arpanet computers switch over to TCP/IP

January 1, 1983 was the deadline for Arpanet computers to switch over to the TCP/IP protocols developed by Vinton Cerf. A few hundred computers were affected by the switch. The name server was also developed in 1983.

1984: Domain Name System (DNS)

The domain name system was created in 1984 along with the first Domain Name Servers (DNS). The domain name system was important in that it made addresses on the Internet more human-friendly compared to its numerical IP address counterparts. DNS servers allowed Internet users to type in an easy-to-remember domain name and then converted it to the IP address automatically.

1985: Virtual communities

1985 brought the development of The WELL (short for Whole Earth'Lectronic Link), one of the oldest virtual communities still in operation. It was developed by Stewart Brand and Larry Brilliant in February of 1985. It started out as a community of the readers and writers of the Whole Earth Review and was an open but "remarkably literate and uninhibited intellectual gathering". Wired Magazine once called The WELL "The most influential online community in the world."

1986: Protocol wars

The so-called Protocol wars began in 1986. European countries at that time were pursuing the Open Systems Interconnection (OSI), while the United States was using the Internet/Arpanet protocol, which eventually won out.

1987: The Internet grows

By 1987, there were nearly 30,000 hosts on the Internet. The original Arpanet protocol had been limited to 1,000 hosts, but the adoption of the TCP/IP standard made larger numbers of hosts possible.

1988: IRC – Internet Relay Chat

Also in 1988, Internet Relay Chat (IRC) was first deployed, paving the way for real-time chat and the instant messaging programs we use today.

1988: First major malicious internet-based attack

One of the first major Internet worms was released in 1988. Referred to as "The Morris Worm", it was written by Robert Tappan Morris and caused major interruptions across large parts of the Internet.

1989: AOL is launched

When Apple pulled out of the AppleLink program in 1989, the project was renamed and America Online was born. AOL, still in existence today, later on made the Internet popular amongst the average internet users.

1989: The proposal for the World Wide Web

1989 also brought about the proposal for the World Wide Web, written by Tim Berners-Lee. It was originally published in the March issue of MacWorld, and then redistributed in May 1990. It was written to persuade CERN that a global hypertext system was in CERN's best interest. It was originally called "Mesh"; the term "World Wide Web" was coined while Berners-Lee was writing the code in 1990.

1990: First commercial dial-up ISP

1990 also brought about the first commercial dial-up Internet provider, The World. The same year, Arpanet ceased to exist.

1990: World Wide Web protocols finished

The code for the World Wide Web was written by Tim Berners-Lee, based on his proposal from the year before, along with the standards for HTML, HTTP, and URLs.

1991: First web page created

1991 brought some major innovations to the world of the Internet. The first web page was created and, much like the first email explained what email was, its purpose was to explain what the World Wide Web was.

1991: First content-based search protocol

Also in the same year, the first search protocol that examined file contents instead of just file names was launched, called Gopher.

1991: MP3 becomes a standard

Also, the MP3 file format was accepted as a standard in 1991. MP3 files, being highly compressed, later become a popular file format to share songs and entire albums via the internet.

1991: The first webcam

One of the more interesting developments of this era, though, was the first webcam. It was deployed at a Cambridge University computer lab, and its sole purpose was to monitor a particular coffee maker so that lab users could avoid wasted trips to an empty coffee pot.

1993: Mosaic – first graphical web browser for the general public

The first widely downloaded Internet browser, Mosaic, was released in 1993. While Mosaic wasn't the first web browser, it is considered the first browser to make the Internet easily accessible to non-techies.

1993: Governments join in on the fun

In 1993, both the White House and the United Nations came online, marking the beginning of the .gov and .org domain names.

1994: Netscape Navigator

Mosaic's first big competitor, Netscape Navigator, was released the year following (1994).

1995: Commercialization of the internet

1995 is often considered the first year the web became commercialized. While there were commercial enterprises online prior to 1995, there were a few key developments that happened that year. First, SSL (Secure Sockets Layer) encryption was developed by Netscape, making it safer to conduct financial transactions (like credit card payments) online.

In addition, two major online businesses got their start the same year. The first sale on "Echo Bay" was made that year. Echo Bay later became eBay. Amazon.com also started in 1995, though it didn't turn a profit for six years, until 2001.

1995: Geocities, the Vatican goes online, and JavaScript

Other major developments that year included the launch of Geocities (which officially closed down on October 26th, 2009).

The Vatican also went online for the first time.

Java and JavaScript (originally called LiveScript by its creator, Brendan Eich, and deployed as part of the Netscape Navigator browser) was first introduced to the public in 1995. ActiveX was launched by Microsoft the following year.

1996: First web-based service——webmail

In 1996, Hotmail [8] (the capitalized letters are an homage to HTML), the first webmail service, was launched(Fig.1-1).
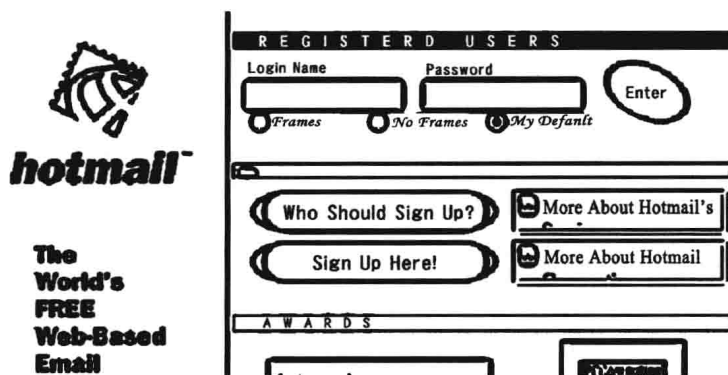

Fig. 1-1　Homepage of Hotmail

1997: The term "weblog" is coined

While the first blogs had been around for a few years in one form or another, 1997 was the first year the term "weblog" was used.

1998: Google

Google went live in 1998, revolutionizing the way in which people find information online (Fig.1-2).

1998: Internet-based file-sharing gets its roots

In 1998 as well, Napster launched, opening up the gates to mainstream file-sharing of audio files over the internet.

1999: SETI@home project

1999 is the year when one of the more interesting projects ever brought online: the SETI @home project, launched. The project has created the equivalent of a giant supercomputer by harnessing the computing power of more than 3 million computers worldwide, using their processors whenever the screensaver comes on, indicating that the computer is idle. The program analyzes radio telescope data to look for signs of extraterrestrial intelligence.

Copyright ©1998 Google Inc.

Fig. 1-2   Homepage of Google

2000: The bubble bursts

2000 was the year of the dotcom collapse, resulting in huge losses for legions of investors. Hundreds of companies closed, some of which had never turned a profit for their investors. The NASDAQ, which listed a large number of tech companies affected by the bubble, peaked at over 5,000, then lost 10% of its value in a single day, and finally hit bottom in October of 2002.

2001: Wikipedia is launched

With the dotcom collapse still going strong, Wikipedia launched in 2001, one of the websites that paved the way for collective web content generation/social media.

2003: VoIP goes mainstream

In 2003: Skype is released to the public, giving a user-friendly interface to Voice over IP calling.

2003: MySpace becomes the most popular social network

Also in 2003, MySpace opens up its doors. It later grew to be the most popular social network at one time (though it has since been overtaken by Facebook).

2003: CAN-SPAM Act puts a lid on unsolicited emails

Another major advance in 2003 was the signing of the Controlling the Assault of Non-Solicited Pornography and Marketing Act of 2003, better known as the CAN-SPAM Act.

2004: Web 2.0

Though coined in 1999 by Darcy DiNucci, the term "Web 2.0", referring to websites and Rich Internet Applications (RIA) that were highly interactive and user-driven became popular around 2004. During the first Web 2.0 conference, John Batelle and Tim O'Reilly described the concept of "the Web as a Platform": software applications built to take advantage of internet connectivity, moving away from the desktop (which has downsides such as operating system dependency and

lack of interoperability).

2004: Social Media and Digg

The term "social media", believed to be first used by Chris Sharpley, was coined in the same year that "Web 2.0" became a mainstream concept. Social media–sites and web applications that allow its users to create and share content and to connect with one another–started around this period.

Digg, a social news site, launched on November of 2004, paving the way for sites such as Reddit, Mixx, and Yahoo! Buzz. Digg revolutionized traditional means of generating and finding web content, democratically promoting news and web links that are reviewed and voted on by a community.

2004: "The" Facebook open to college students

Facebook launched in 2004, though at the time it was only open to college students and was called "The Facebook"; later on, "The" was dropped from the name, though the URL http:// www.thefacebook.com still works.

2005: YouTube—streaming video for the masses

YouTube launched in 2005, bringing free online video hosting and sharing to the masses.

2006: Twitter gets twittering

Twitter launched in 2006. It was originally going to be called twittr (inspired by Flickr); the first Twitter message was "just setting up my twttr".

2007: Major move to place TV shows online

Hulu was first launched in 2007, a joint venture between ABC, NBC, and Fox to make popular TV shows available to watch online.

2007: The iPhone and the Mobile Web

The biggest innovation of 2007 was almost certainly the iPhone, which was almost wholly responsible for renewed interest in mobile web applications and design.

2008: "Internet Election"

The first "Internet Election" took place in 2008 with the U.S. Presidential election. It was the first year that national candidates took full advantage of all the Internet had to offer. Hillary Clinton jumped on board early with YouTube campaign videos. Virtually every candidate had a Facebook page or a Twitter feed, or both.

Ron Paul set a new fundraising record by raising $4.3 million in a single day through online donations, and then beat his own record only weeks later by raising $4.4 million in a single day.

The 2008 elections placed the Internet squarely at the forefront of politics and campaigning, a trend that is unlikely to change any time in the near future.

2009: ICANN policy changes

2009 brought about one of the biggest changes to come to the Internet in a long time when the U.S. relaxed its control over ICANN, the official naming body of the Internet (they're the organization in charge of registering domain names).

The Future?

Where is the future of the Internet headed?

Words

gateway ['geɪtweɪ] n. 网关，两个不同网络之间实现连接的设备
homepage ['həʊmˌpeɪdʒ] n. 主页，通过万维网(Web)进行信息查询的起始信息页
internet ['ɪntənet] n. 国际互联网，因特网

Phrases

computer network   计算机网络

Abbreviations

BBS	Bulletin Board System	电子布告栏系统
DNS	Domain Name Server	域名服务器
HTML	Hypertext Markup Language	超文本标记语言
HTTP	Hypertext Transfer Protocol	超文本传输协议
ICP	Internet Content Provider	互联网内容提供商
ISP	Internet Service Provider	互联网服务提供商
MUD	Multi-User Dungeon	多用户网络游戏
URL	Uniform Resource Locator	统一资源定位符,网页地址
WWW	World Wide Web	万维网

Notes

1．UCLA: University of California at Los Angeles 美国加州大学洛杉矶分校
2．FreeBSD: FreeBSD 是一种 UNIX 操作系统，是由经过 BSD、386BSD 和 4.4BSD 发展而来的 Unix 的一个重要分支。BSD 是 Berkeley Software Distribution 的缩写，意思是"伯克

利软件发行版"。显然，BSD 这个名称并不是我们现在所理解的操作系统，而且其原意也并非简单的操作系统，而是一整套软件发行版的统称。从软件发行版到操作系统的演变是有历史过程的，这一点对 FreeBSD 很重要。

3．MIT: Massachusetts Institute of Technology，麻省理工学院

4．public domain：指书籍因版权过期而进入的公有领域

5．OCR: Optical Character Recognition，光学字符识别

6．University College of London：伦敦大学学院（简称 UCL）是一所创建于 1826 年的综合大学，是伦敦第一所大学，也是伦敦大学联盟的创校学院。UCL 是英国史上第一所不以种族、宗教和政治背景而录取学生的大学。UCL 一直以来与牛津大学、剑桥大学、帝国学院和伦敦政经学院一起并称为 G5 超级精英大学和金三角名校，它同时是罗素大学集团与欧洲研究型大学联盟的成员。1973 年，UCL 成为阿帕网（ARPANET）的第一个国际链接。

7. Dennis Hayes and Dale Heatherington：1978 年的一个夏天，美国人丹尼斯·海斯（Dennis Hayes）与伙伴戴尔·赫斯林顿（Dale Heatherington）在海斯家的餐桌上又一次会面，力图大业的二人终于在餐桌上运用 DOS 系统测试 AT 指令成功连接了世界上第一台 Modem，勾勒互联网前景的使命开始了。

8．Hotmail：创始人杰克·史密斯（Jack Smith）想出了最初的主意，要建立一种任何计算机都可以通过 Web 访问的电子邮件服务。当 Sabeer Bhatia 起草商业计划书的时候，他尝试了各种以 mail 结尾的名字，最后，他选择了 Hotmail。因为 Hotmail 包含了"HTML"——编写网页的语言。Hotmail 最早的形式是 HoTMaiL。

9．ICANN: Internet Corporation for Assigned Names and Numbers，互联网名称与数字地址分配机构，总部设在美国加利福尼亚州的一个非营利性国际组织，在美国商务部的提议下于 1998 年 10 月成立的，负责互联网协议（IP）地址的空间分配、协议标识符的指派、通用顶级域名（gTLD）以及国家和地区顶级域名（ccTLD）系统的管理，以及根服务器系统的管理。之所以由它管理全球顶级域名，是因为互联网的雏形源于美国国防部的一个项目，后来才被转为民用。

Exercises

Ⅰ. Fill in the blanks according to the passage.

The Internet is an international computer _____ . It _____ computer networks all over the world. People can get different kinds of _____ from it. There are millions of _____ on the Internet. There is a lot of useful information on the websites. You can use _____ _____ to find the information you need. It can help us find information quickly and easily. Type in a keyword or keywords and the search engine will give you a list of _____ websites to look at.

Ⅱ. Translate the following sentences into Chinese or English.

1．The Internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented

integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location.

2．The Internet today is a widespread information infrastructure, the initial prototype of what is often called the National (or Global or Galactic) Information Infrastructure. Its history is complex and involves many aspects - technological, organizational, and community. And its influence reaches not only to the technical fields of computer communications but throughout society as we move toward increasing use of online tools to accomplish electronic commerce, information acquisition, and community operations.

3．Most traditional communications media including telephone, music, film, and television are reshaped or redefined by the Internet, giving birth to new services such as Voice over Internet Protocol (VoIP) and Internet Protocol Television (IPTV). Newspaper, book and other print publishing are adapting to Web site technology, or are reshaped into blogging and web feeds.

4．今天，Internet 已连接 60000 多个网络，正式连接 86 个国家，电子信箱能通达 150 多个国家，有 480 多万台主机通过它连接在一起，用户有 2500 多万，每天的信息流量达到万亿比特（terabyte）以上，每月的电子信件突破 10 亿封。

5．互联网推进了中国经济社会发展。在经济领域，互联网加速向传统产业渗透，产业边界日益交融，新型商务模式和服务经济加速兴起，衍生了新的业态。互联网在促进经济结构调整、转变经济发展方式等方面发挥着越来越重要的作用。