Web Development & Design Foundations with HTML5 8th Edition

CHAPTER 12
KEY CONCEPTS

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Learning Outcomes

In this chapter, you will learn how to

- define e-commerce
- identify benefits and risks of e-commerce
- describe e-commerce business models
- describe e-commerce security and encryption
- define Electronic Data Interchange (EDI)
- describe trends and projections for e-commerce
- describe issues related to e-commerce
- describe options for order and payment processing

What is E-Commerce?

- The integration of communications, data management, and security technologies to allow individuals and organizations to exchange information related to the sale of goods and services.

- Major functions of E-Commerce include:
  - the buying of goods,
  - the selling of goods, and
  - performance of financial transactions on the Internet.

E-Commerce Advantages for Businesses

- Reduced Costs
- Increased Customer Satisfaction
- More Effective Data Management
- Potentially Higher Sales

E-Commerce Advantages for Consumers

- Convenience
- Easier Comparison Shopping
- Wider Selection of Goods

E-Commerce Risks for Businesses

- Need for a robust, reliable web site
- Fraudulent transactions
- Customer reluctance to purchase online
- Increased competition

E-Commerce Risks for Consumers

- Possible Security Issues
- Possible Privacy Issues
- Purchasing from photos & descriptions
- Possible difficulty with returns

E-Commerce Business Models

- B2C – Business-to-Consumer
- B2B – Business-to-Business
- C2C – Consumer-to-Consumer
- B2G – Business-to-Government

Electronic Data Interchange (EDI)

The transfer of data between different companies using networks.

- Facilitates the exchange of standard business documents including purchase orders and invoices

EDI is not new -- In existence since the 1960s

Trading Partners

- Organizations that exchange EDI transmissions

Newer technologies

- XML and Web Services are replacing traditional EDI
- Provide opportunities to customize secure information exchange over the Internet

E-Commerce U.S. Retail Sales

What do people buy online?

1. Clothing, accessories, and footwear ($40 billion)
2. Electronics and appliances ($22.75 billion)
3. Furniture and home furnishings ($20 billion)
4. Drugs, health aids, and beauty aids ($17 billion)
5. Computer hardware ($14.7 billion)
6. Music and videos ($10.25 billion)
7. Books and magazines ($10.2 billion)
8. Sporting goods ($7.8 billion)
9. Computer software ($5.41 billion)
10. Food, beer, and wine ($5.15 billion)

2013 Sales Figures

http://www2.census.gov/retail/releases/current/arts/ecommerce4541.xls

Who's On the Internet?

Category	Percentage That Use the Internet
Men	87%
Women	86%
Age: 18-29	97%
Age: 30-49	93%
Age: 50-64	88%
Age: Over 65	57%
Household Income: Less than $30,000	77%
Household Income: $30,000 to $49,999	85%
Household Income: $50,000 to $74,999	93%
Household Income: $75,000 or higher	99%
Education: High school graduate	77%
Education: Some college	91%
Education: College graduate	97%

- Source: http://www.pewinternet.org/data-trend/internet-use/latest-stats/
- Other Demographics:
  - http://www.pewinternet.org/
  - http://www.clickz.com
  - http://www.census.gov/eos/www/ebusiness614.htm

E-Commerce Issues

- Intellectual Property
- Security
- Fraud
- Taxation
- International Commerce

E-Commerce Security

- Encryption
  - Ensures privacy within an organization and on the Internet.
  - The conversion of data into an unreadable form, called a ciphertext.
- Decryption
  - The process of converting the ciphertext back into its original form, called plaintext or cleartext, so it can be understood.
- The encryption/decryption process requires an algorithm and a key.

E-Commerce Security Encryption Types

Secure E-Commerce transactions use the encryption technologies below:

- Symmetric-key Encryption
- Asymmetric-key Encryption
- Hash Encryption

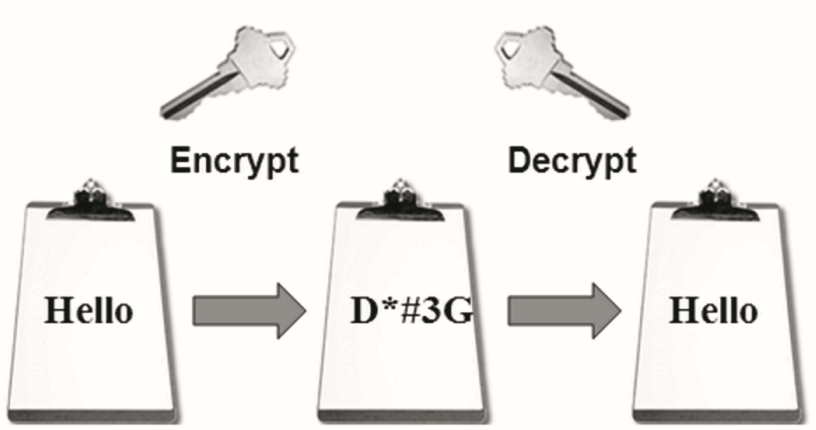
SSL (Secure Sockets Layer)

- Utilizes these encryption technologies
- Provides for secure transmission of data on the Internet.

E-Commerce Security: Symmetric-Key

Symmetric-Key Encryption

- Also called single-key encryption
- Both encryption and decryption use the same key
- Both the sender and receiver must know the key before communicating using encryption.
- Advantage: speed

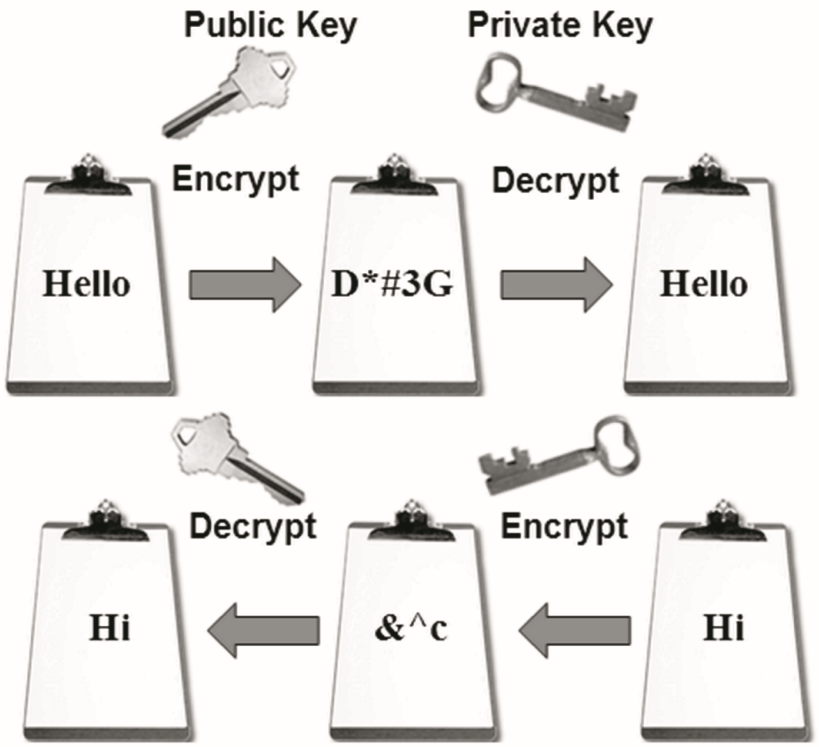


E-Commerce Security: Asymmetric-key

Asymmetric-Key Encryption

- Also called public-key encrypt
- There is no shared secret
- Two keys are created at the same time:
  - Public key
  - Private key

◦ Asymmetric-key encryption is much slower than symmetric-key encryption.



E-Commerce Security: Hash

Hash Encryption

A hash algorithm transforms a string of characters into a "digest"

- A shorter fixed-length value or key that represents the original string

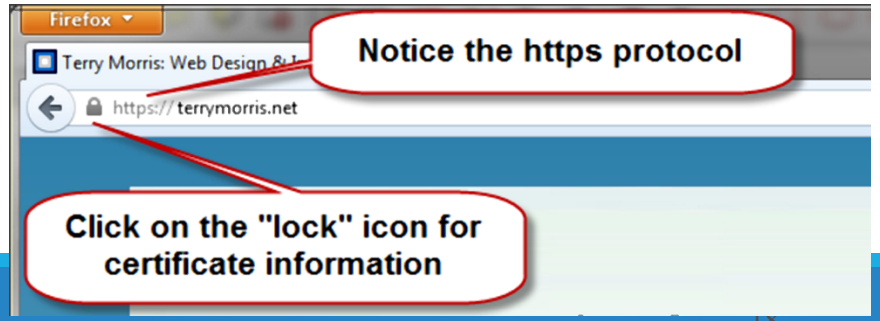
One-way encryption

Used for information that will not be read or decrypted

Purpose: verify the integrity of information

Secure Sockets Layer (SSL)

- A protocol that allows data to be privately exchanged over public networks
- Developed by Netscape
- Encrypts data sent between a client (usually a Web browser) and a Web server.
- Utilizes both symmetric and asymmetric keys.
- "https" protocol
- Browsers display a "lock" icon



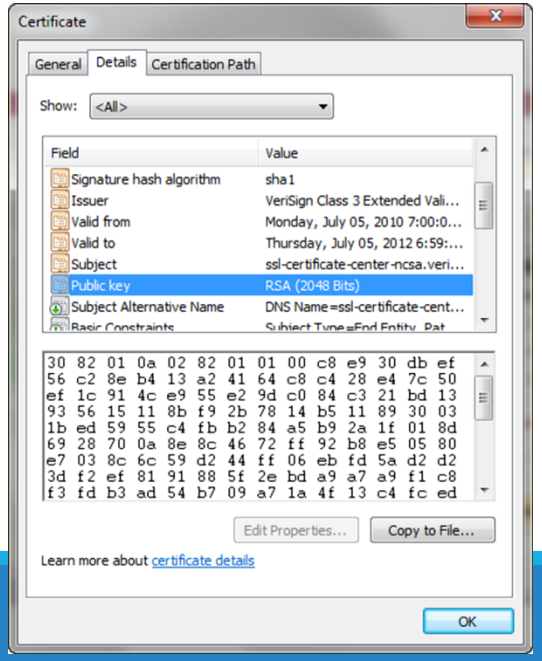
Secure Sockets Layer (SSL)

SSL provides secure communication between a client and server by using:

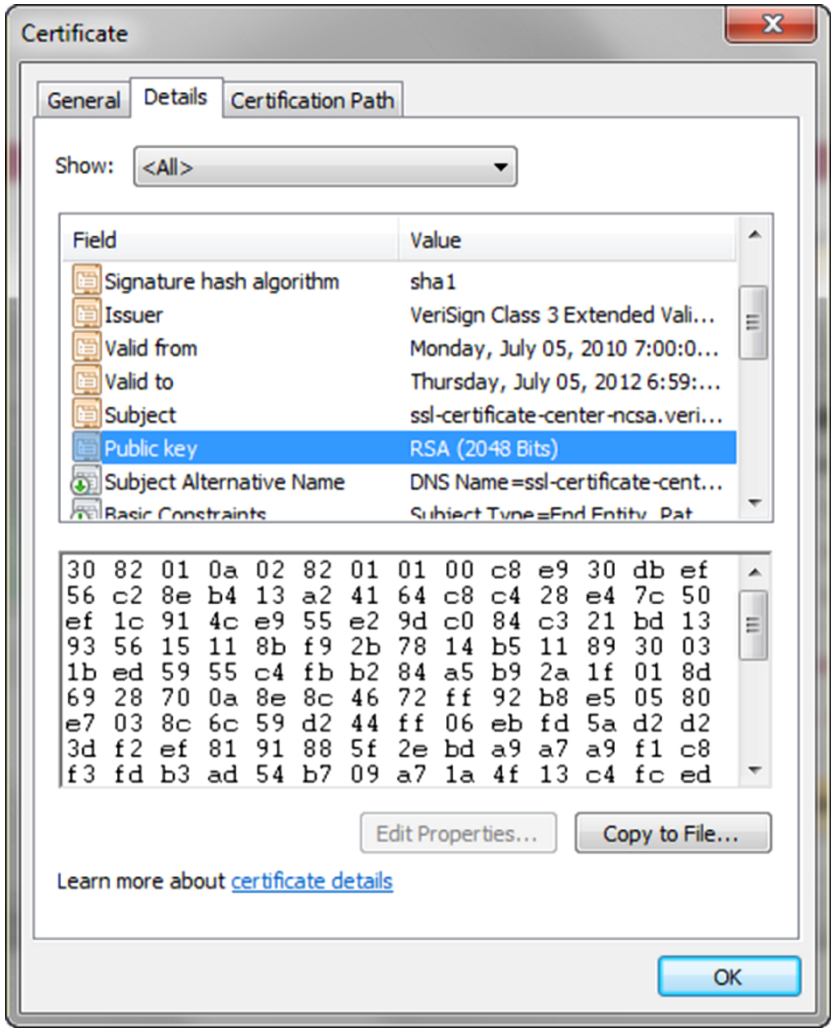
- Server and (optionally) client digital certificates for authentication
- Symmetric-key cryptography using a "session key" for bulk encryption
- Public-key cryptography for transfer of the session key
- Message Digests (hash encryption) to verify the integrity of the transmission

SSL & Digital Certificate

- Digital Certificate
  - A form of an asymmetric key
    - Also contains information about the certificate, the holder of the certificate, and the issuer of the certificate.
  - Used by SSL to authenticate the identity of the web server



Digital Certificate



The contents of a digital certificate include:

- The public key
- Effective date of the certificate
- Expiration date of the certificate
- Details about the Certificate Authority -- the issuer of the certificate
- Details about the certificate holder
- A digest of the certificate content

Certificate Authority

A trusted third-party organization or company that issued digital certificates.

Well-known Certificate Authorities:

- Verisign
  - http://www.verisign.com
- Thawte
  - http://www.thawte.com

Checkpoint

1. *Describe three advantages of e-commerce for an entrepreneur just starting a business.*

2. *Describe three risks that businesses face when engaging in e-commerce.*

3. *Define SSL. Describe how an online shopper can tell that an e-commerce site is using SSL.*

Order & Payment Processing

E-Commerce Payment Methods:

- Credit Card
- Stored-value Card
- Smart Card
- Digital Cash

E-Commerce Storefront Solutions

- Instant Online Storefront
  - Shopify, BigCommerce
- Off-The-Shelf Shopping Cart Software
  - Agoracart, osCommerce, ZenCart
- Custom Built Solution
  - IBM's WebSphere Commerce Suite, Microsoft's Commerce Server
  - Microsoft Visual Studio, Adobe Dreamweaver
- Semi-Custom Built Solutions on a Budget
  - Paypal order processing
  - Free shopping cart scripts

Checkpoint

1. *List three payment methods commonly used on the Web.*

2. *Have you purchased online? If so, think of the last item that you purchased.*
   a. *Why did you purchase it online instead of at a store?*
   b. *Did you check to see if the transaction was secure? Why or why not?*
   c. *How will your shopping habits be different in the future?*

3. *Describe three types of e-commerce solutions available. Which provides the easiest entry to e-commerce? Explain.*

Summary

This chapter introduced you to basic e-commerce concepts and implementations.

Consider taking an E-Commerce course in the future to continue your study of this dynamic and growing area of web development.