

3. Network attack and defense

Many (most?) companies guard against network attacks by using firewalls and SSL encryption on their financial traffic on the World Wide Web. Use the 'Top vulnerabilities' slide from lecture 18, which is more up to date than Anderson's list in chapter 18, as one of the sources of information to answer this question.

a. List at least four significant risks that this strategy does not address.

1. Weak passwords.
2. Program bugs, particularly stack overflows:
 - Operating systems (Windows, Linux)
 - Middleware (Microsoft COM, ActiveX in particular; Windows libraries)
 - Office suites (MS Office, Outlook, but others also)
 - Applications (including antivirus software)
 - Web software (Internet Explorer, PHP)
 - Databases (SQL injection)
3. Instant messaging, P2P networks, media players: programs likely not authorized to be on corporate or organization machines, introducing viruses, worms, etc. (Your firewall may block some of this traffic, but much can run over port 80, HTTP)
4. Internet network infrastructure, such as DNS servers, routers, etc. Bad configuration, default passwords, etc.
5. Introduction of viruses through memory sticks, CDs, laptop computers, etc.
6. Denial of service attacks: SYN, smurfing, distributed denial of service, spam, routing, etc.

b. List measures to mitigate the risks you list.

1. Passphrases, other strong password policies as discussed in Anderson
2. Patching software as quickly as possible
3. Disable ports as possible; monitor network traffic; educate and monitor users
4. Configure network infrastructure carefully, audit configuration, passwords, etc.
5. Educate users; set up separate wireless network for laptops, firewalled from rest of corporate network.
6. Intrusion detection

4. Credit card costs and fraud

a. What is the credit card fraud rate in various countries? Find these numbers in Anderson chapter 19; they are dated but still approximately correct.

1% US, 0.2% UK, <0.1% France and Spain. France reduced to 0.028 to 0.04% but has seen increased transborder fraud. Spain reduced to 0.008%

b. Define the merchant discount. While Anderson notes it as 4 to 5%, large corporations (sellers of consumer products, including public transport agencies) often negotiate much lower rates, as low as 1.2 to 1.7%. What fraction of the merchant discount is taken by fraud costs?

Merchant discount is the commission the credit card company takes for handling the transaction. It gives the merchant the amount of the sale, less the merchant discount, generally every night. In the US, a major portion of the merchant discount, over half, is taken by fraud costs. In other countries, it is generally less than 10%

c. The credit card company pays the merchant nightly, but is paid by the customer only at the end of the month. Many cards offer 1% cash back or airline miles. What fraction of the merchant discount is taken by these costs? Assume the credit card company obtains funds at 6% per year, or about 0.5% per month. Assume that partners subsidize half the incentives (miles, cash back).

Carrying the payment for a month or more on average, takes 0.5% or more. Incentives take about the same amount. In total, they take about 1%.

d. How do the credit card issuers make money on credit cards, then? Discuss aggressive marketing, monthly finance charges, and aggressive chargebacks of fraudulent charges to merchants if they haven't followed all procedures required by the credit card company.

In the US, cards are marketed aggressively to customers who the credit card issuers expect to pay finance charges of 25% per year, or about 4% per month on the balance. Aggressive chargebacks to merchants are a small cost element, since fraud is 1% and chargebacks to merchants are a small fraction of 1%.

e. Is there a long-term level of fraud that your company or organization will need to manage because it accepts credit cards?

Yes. You'll need security procedures, audit procedures, negotiations with the credit card issuers for routine problems, and more negotiations if you offer incentives, etc.