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Hackernomics

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PEOPLE SECURITY

The Shifting IT Environment

(…or why security is becoming one of the most important issues in software development)

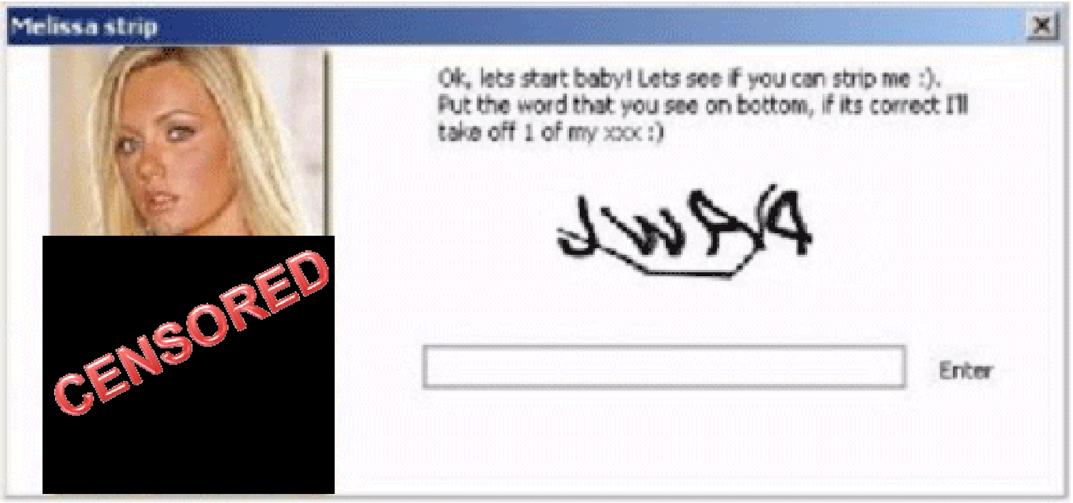
Shift: Technology

- **Software communications is fundamentally changing – many transaction occur over the web:**
  - Service Oriented Architecture (SOA), AJAX, …
- **Network defenses are covering a shrinking portion of the attack surface**
- **Legacy code is being exposed widely**
- **The security model has changed from good guys vs. bad guys to enabling partial trust**
  - There are more “levels” of access: Extranets, partner access, customer access, identity management, …
- **Social networking gives attackers access to much more personal and product information**

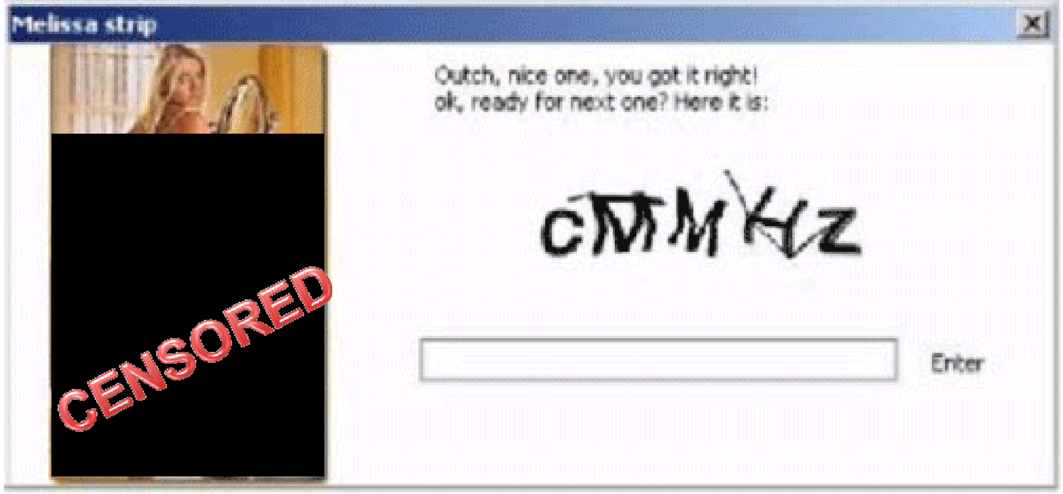
Shift: Attackers

- **Attackers are becoming organized and profit-driven**
- **An entire underground economy has been created:**
  - Meeting place for buyers and sellers (chat rooms, auction sites, etc.)
  - What they are trading: vulnerabilities, botnet time, credit card numbers, PII, ...
  - New ways to exchange of “value” anonymously and in non-sovereign currency

Example: The CAPTCHA Dilemma



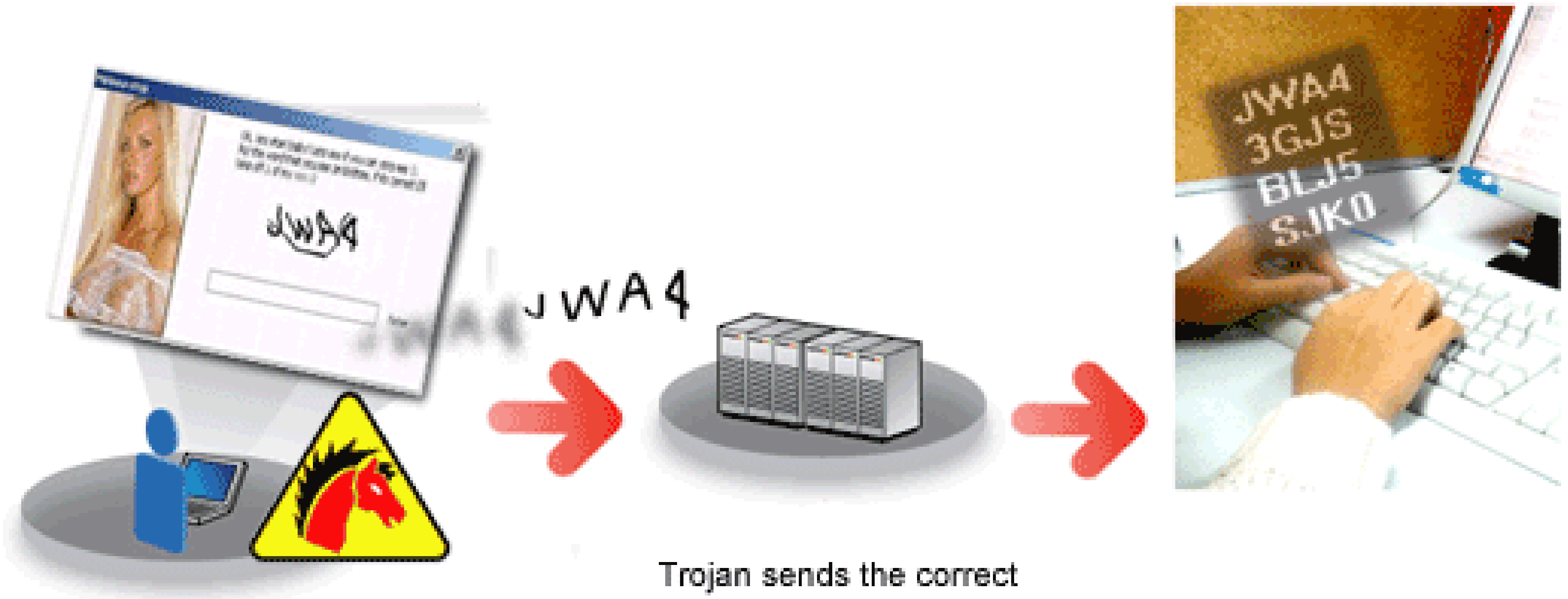
Ok, lets start baby! Lets see if you can strip me :). Put the word that you see on bottom, if its correct I'll take off 1 of my xxx :)



Outch, nice one, you got it right!
ok, ready for next one? Here it is:

Source: Trend Micro http://blog.trendmicro.com/captcha-wish-your-girlfriend-was-hot-like-me/

Automated Exploitation



TROJ_CAPTCHAR.A disguises itself as a strip-tease game enticing the user to input correctly a given CAPTCHA code

Trojan sends the correct codes to a remote server

Remote malicious user acquires and matches the correct code for a given CAPTCHA on a Web site (ex. *Yahoo!*)

Source: Trend Micro http://blog.trendmicro.com/captcha-wish-your-girlfriend-was-hot-like-me/

Shift: Compliance and Consequences

- **The business has to adhere to regulations, guidelines, standards,…**
  - SOX and SAS 112 – have upped the ante on financial audits (and supporting IT systems)
  - PCI DSS – Requirements on companies that process payment cards
  - HIPAA, GLBA, BASEL II, …, many more
- **Audits are changing the economics of risk and create an "impending event"**

  Hackers *may* attack you but auditors *will* show up
- **Disclosure laws mean that the consequences of failure have increased**
  - Waves of disclosure legislation

Shift: Customer expectations

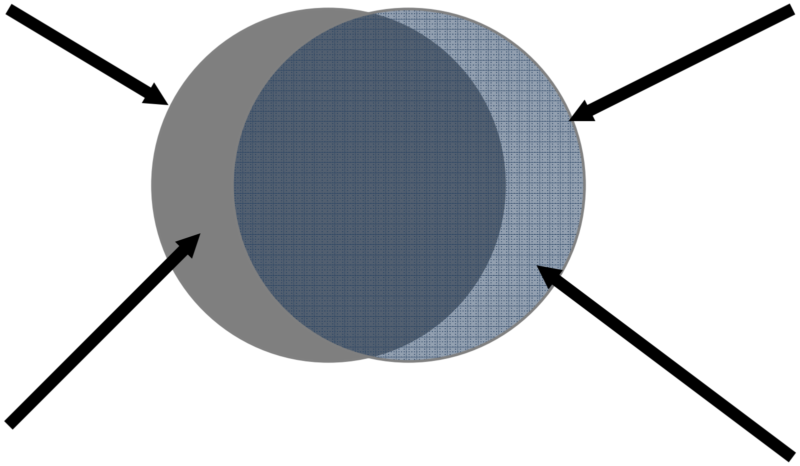
- Customers , especially businesses, are starting to use security as a discriminator
- In many ways security has become a non-negotiable expectation of business software
- Banks, photocopiers, pens, etc. are being sold based on security…
- Security starting to be woven into service level agreements (SLAs)

Hackernomics (***noun***)

A social science concerned chiefly with description and analysis of attacker motivations, economics, and business risk. Characterized by

5 fundamental immutable laws and 6 corollaries

Why *security* bugs are different*



Intended Behavior

Actual Behavior

Traditional Bugs

Most Security Bugs

* Source: *How to Break Software Security* by J. Whittaker and H. Thompson. Addison Wesley, 2003.

Law 1

Most attackers aren't evil or insane; they just want something

Corollary 1.a.:

We don't have the budget to protect against evil people but we *can* protect against people that will look for weaker targets

Corollary 1.b.:

Security Theatre can sometimes be good…assuming that the cost to test it does not approach $0

Law 1: Implications

- Need to value corporate assets smarter (i.e. what are they worth to an attacker?)
- Need to adopt risk management approaches that identify high-value targets and then do threat modeling to determine how those targets can be reached
- Need to make sure that systems are strong and *appear strong* when viewed by an attacker.

Law 2

The type of data that attackers care about is changing

Corollary 2.a.:

When new data suddenly becomes important we have a big archival problem

Law 2: Implications

- Need to value customer data beyond what is currently legally protected
- Need to plan for changes in privacy requirements and legislation that address stored data like “pet’s name”
- Need to plan for new requirements on data disposal

Law 3

In the absence of metrics, we tend to over focus on risks that are either familiar or recent.

Law 3: Implications

- Decisions (including budget allocation decisions) need to be made based on comprehensive risk assessments as opposed to recent incidents
- Be open to new technologies and methods but carefully map their benefit to your risks

Law 4

In the absence of security education or experience, people (customers, managers, developers, testers, designers) naturally make poor security decisions with technology

Corollary 4.a.:

Software needs to be easy to use securely and difficult to use insecurely

Law 4: Implications

- Need to ingrain security awareness into the culture
- Need to also assume that people will continue to make poor security decisions and make it easier to make correct ones by baking it into system design

Law 5

Most costly breaches come from simple failures, not from attacker ingenuity

Corollary 5.a.:

Bad guys can, however, be VERY creative if properly incentivized.

Law 5: Implications

- Need to reverse engineer the assumptions that went into building legacy systems and ensure that they still hold in the current climate
- Need to do “low hanging fruit” risk analysis in addition to looking through the weeds
- Need to spend more time investigating procedures than technology

Summary

- Software security is about ensuring that security code / features are present and implemented properly and that functional features are implemented securely
- Embrace the attacker and think like him / her to succeed – become a hackernomist

Questions?

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