Risk Communication as Security Interaction in the IoT

Unpacking the Future of IoT
17 August 2017
Salish, WA
L Jean Camp
Security Interaction
Helpful Advice

When you connect to a secure website, the server hosting that site presents your browser with something called a "certificate" to verify its identity. This certificate contains identity information, such as the address of the website, which is verified by a third party that your computer trusts. By checking that the address in the certificate matches the address of the website, it is possible to verify that you are securely communicating with the website you intended, and not a third party (such as an attacker on your network).

In this case, the certificate has not been verified by a third party that your computer trusts. Anyone can create a certificate claiming to be whatever website they choose, which is why it must be verified by a trusted third party. Without that verification, the identity information in the certificate is meaningless. It is therefore not possible to verify that you are communicating with mail.google.com instead of an attacker who generated his own certificate claiming to be mail.google.com. You should not proceed past this point.

If, however, you work in an organization that generates its own certificates, and you are trying to connect to an internal website of that organization using such a certificate, you may be able to solve this problem securely. You can import your organization's root certificate as a "root certificate", and then certificates issued or verified by your organization will be trusted and you will not see this error next time you try to connect to an internal website. Contact your organization's help staff for assistance in adding a new root certificate to your computer.
Improved Security Interaction
Better Risk Communication

Web Forgery

This page is very likely to have been designed to trick users into sharing personal or financial information. Entering any personal information on this page may result in identity theft or other fraud.

Google Safe Browsing uses automated technology to warn you about web pages that we believe may be unsafe. This page appears to be a part of a scam known as a phishing attack, in which criminals create fraudulent pages to mimic legitimate sources that you may trust. You can read more about phishing here [antiphishing.org](http://antiphishing.org).

You can also learn more about [Google Safe Browsing](http://safebrowsing.google.com).

Finally, if you believe this page has been falsely flagged as a forgery, you can [report it to Google](http://google.com).

Get me out of here!  Ignore this warning
People Are Saying

YOU MAKE NO SENSE!!!
GET OUT OF MY WAY!!!
Consider Other People’s Perspectives

One problem, three views: incentives, usability, or risk communication?
Personalize Security
Risk Communication

Mental Models

- Simplify
- Identify
- Reify
- Rectify
Design for Humans Requires Designing for Humans
Smoking is a factor which contributes to lung cancer. Most cancers that start in lung, known as primary lung cancers, are carcinomas that derive from epithelial cells. Depending on the type of tumor, so-called paraneoplastic phenomena may initially attract attention to the disease. In lung cancer, these phenomena may include Lambert-Eaton myasthenic syndrome (muscle weakness due to auto-antibodies), hypercalcemia, or syndrome of inappropriate antidiuretic hormone (SIADH). Tumors in the top (apex) of the lung, known as Pancoast tumors, may invade the local part of the sympathetic nervous system, leading to changed sweating patterns and eye muscle problems (a combination known as Horner’s syndrome) as well as muscle weakness in the hands due to invasion of the brachial plexus.
+ Design for Humans Requires Designing for Humans
Simplify

- Change behavior
- By being helpful
- Make it Easy
Simplify with Mental Models

- Warfare
- Medical infection
- Property crime
- Spatial models
- Economic threat
- Physical assault

- Buggy code
- Targeting Big Fish
- Ubiquitous virus
- Young Geek; Graffiti
- Young Geek; Reputation
- Burglars
- Individual Criminals
- Organized crime

Camp

Wash
Mental Models Make Stories

- Warfare
- Medical infection/ virus
- Graffiti
- Safe spaces
- Stealing money/ economic threat
- Physical assault
Simplify the Mental Model

Align with the stories people tell
Simplify, Reify with Mental Models

Video https://www.youtube.com/watch?v=j7zcufDfRrg
Risk as Multidimensional

- **Risk Context Analysis**
  - Network Context
  - Web Context
  - User Context

- **Observed settings, network activity**
  - Web certificates
  - Actions

- **Per URL**
  - Browser settings

- **Intelligent Interaction**
  - Security reconfig
  - Dialog generation

- **User decisions**

- **Metaphors**
Identify, Reify

You Are Risking It

But Your Videos All Work!
Identify, Reify, Rectify

Look you are safe!

But not everything works.

Chelsea out

Chelsea have crashed out of the Champions League to PSG on away goals while Bayern Munich
Mobile Security Interaction

DESCRIPTION

Brightest Flashlight App – Free of Charge
* Turns on all available lights on the device
* Camera Flash LED at Maximum
* Screen at Bright Maximum
* Keyboard Backlight at Maximum
* Notification LED at Maximum
* Automatic Timer Exits Application after 2 Minutes
* Audio Effects on Start and Stop
* Unobtrusive Ads
* Please contact the support email for reporting bugs or problems so we can fix them as quickly as possible
* Best Flashlight App for dark conditions, natural LED color provides great contrast

Recently Tested Flashlight Configurations:
- Motorola Droid X Flashlight
- Samsung Galaxy S Flashlight
- Motorola Droid2 Flashlight
- Samsung Fascinate Flashlight
- Samsung Epic 4G Flashlight
- Motorola Droid Flashlight
- Motorola Droid Flashlight
- T-Mobile G2 Flashlight
- LG Optimus Flashlight
- LG Ally Flashlight
- Samsung Galaxy Note Flashlight
Rectify: Make Intentions Actionable
Simplify: Android Risks & Benefits

Also used locks and eyeballs
<table>
<thead>
<tr>
<th>Application</th>
<th>Rating</th>
<th>Developer</th>
<th>Status</th>
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<td>★★★★☆</td>
<td>Google Inc.</td>
<td>Update</td>
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