

System Administration

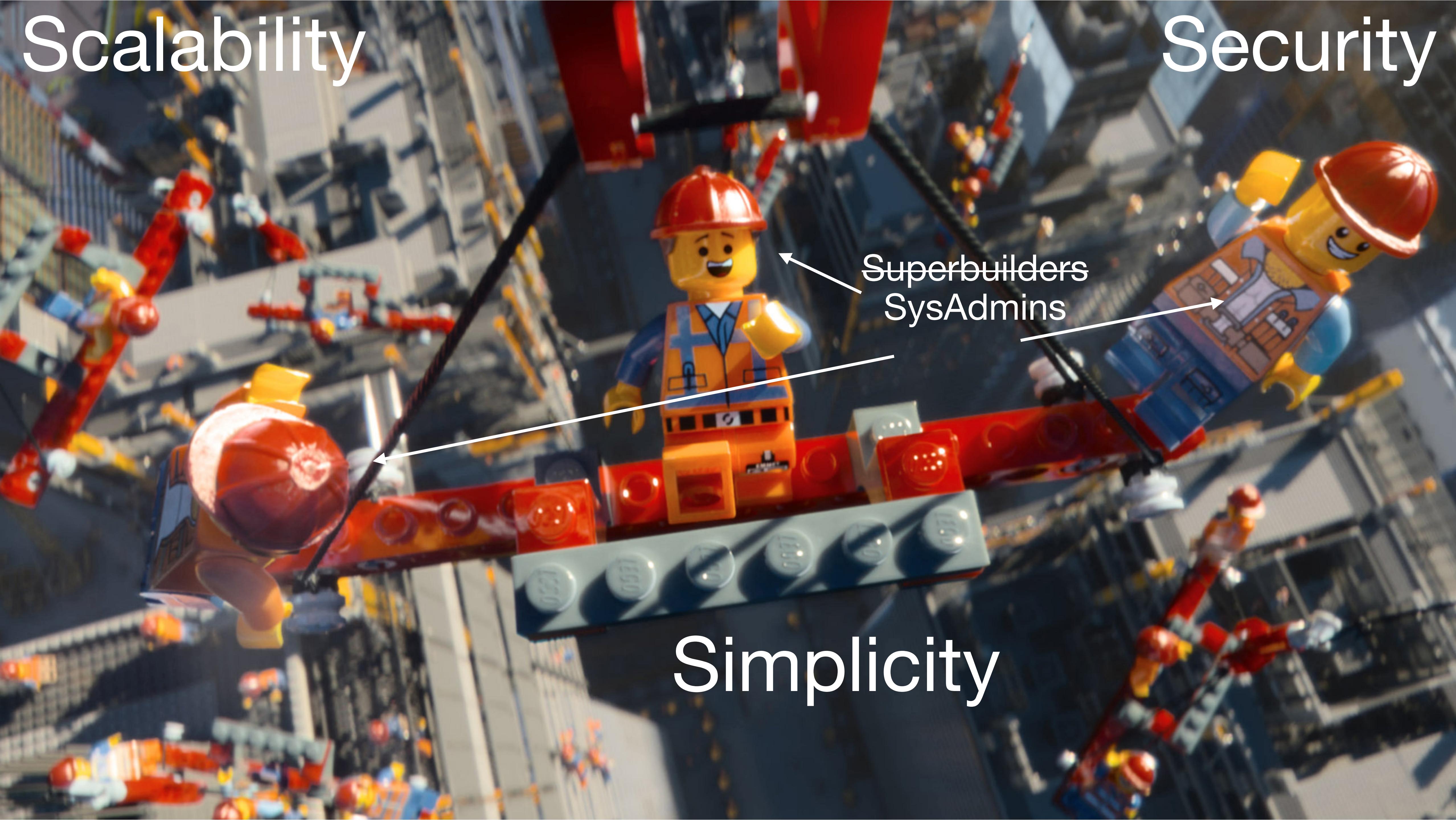
Week 01, Segment 03: Core Principles

Department of Computer Science
Stevens Institute of Technology

Jan Schaumann

jschauma@stevens.edu

<https://stevens.netmeister.org/615/>



Scalability

Security

Simplicity

Superbuilders
SysAdmins

One poorly spec'd
web server.

All your web traffic.

Denial of Service

Scaling Vertically

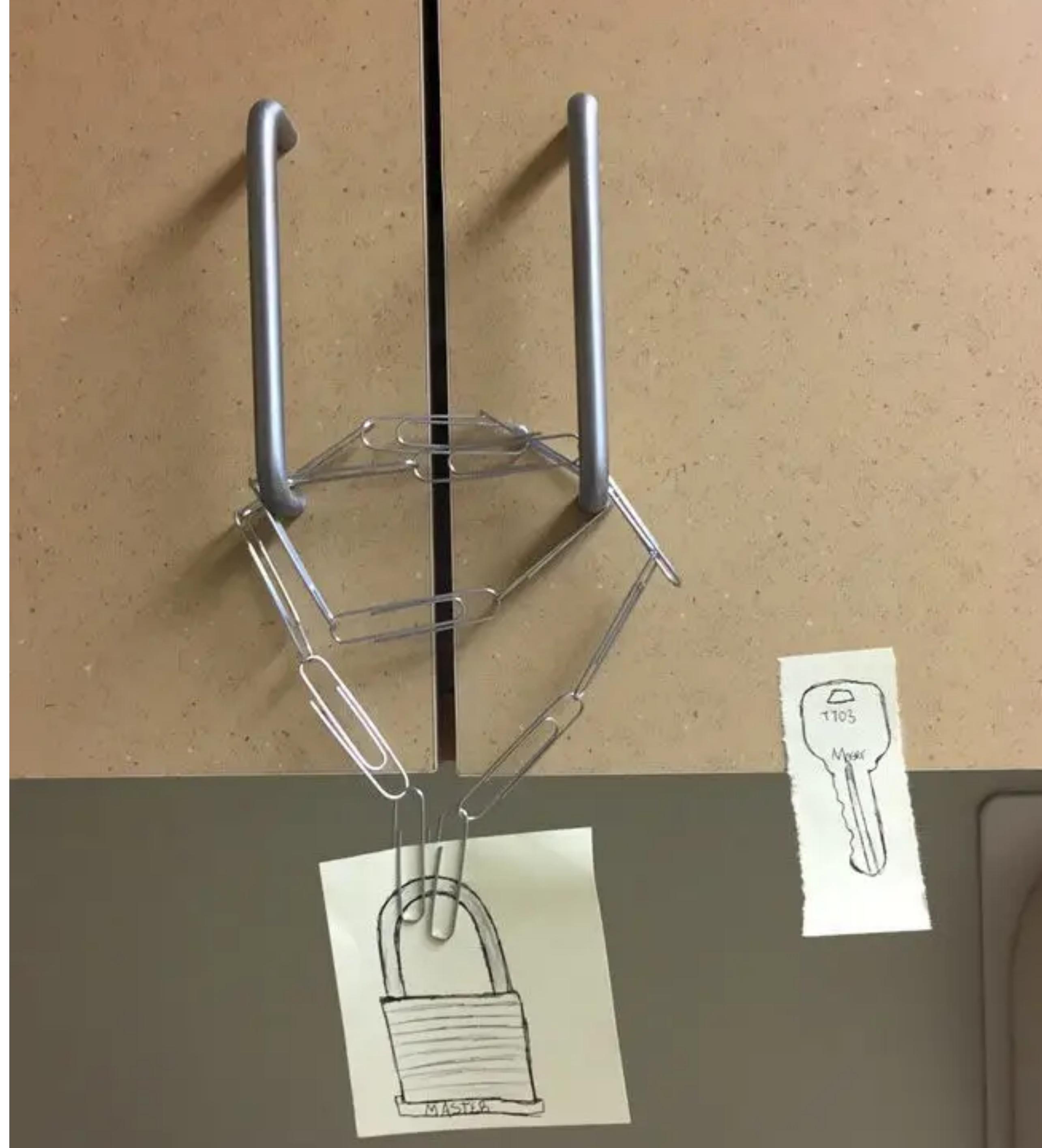


Scaling Horizontally

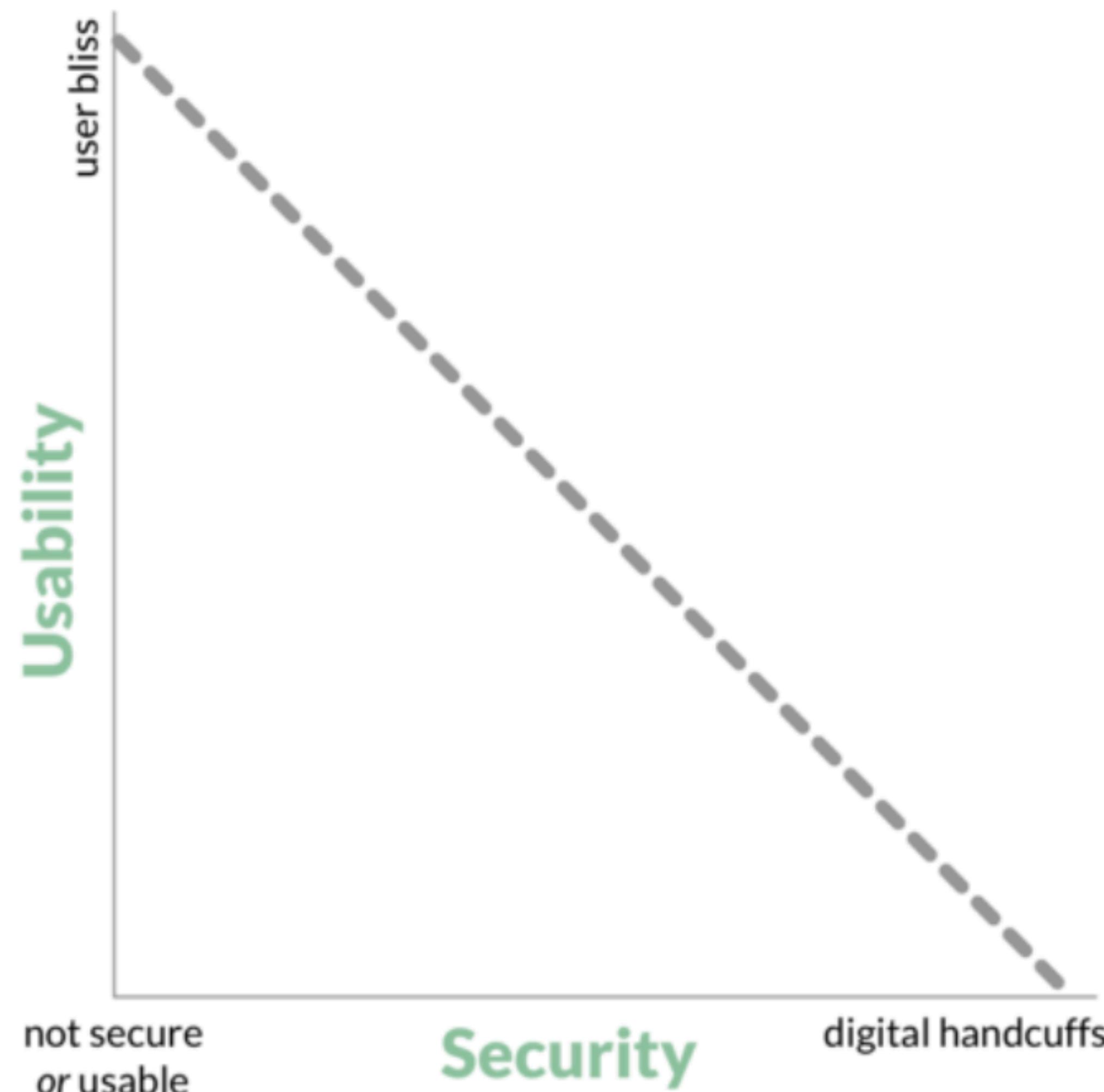


A color photograph of a man in a green coat and a flat cap, riding a dark-colored horse-drawn carriage. He is looking towards the right. Two dogs, one tan and black and one light brown, are running alongside the carriage on a grassy path. The background shows a hillside with autumn-colored trees.

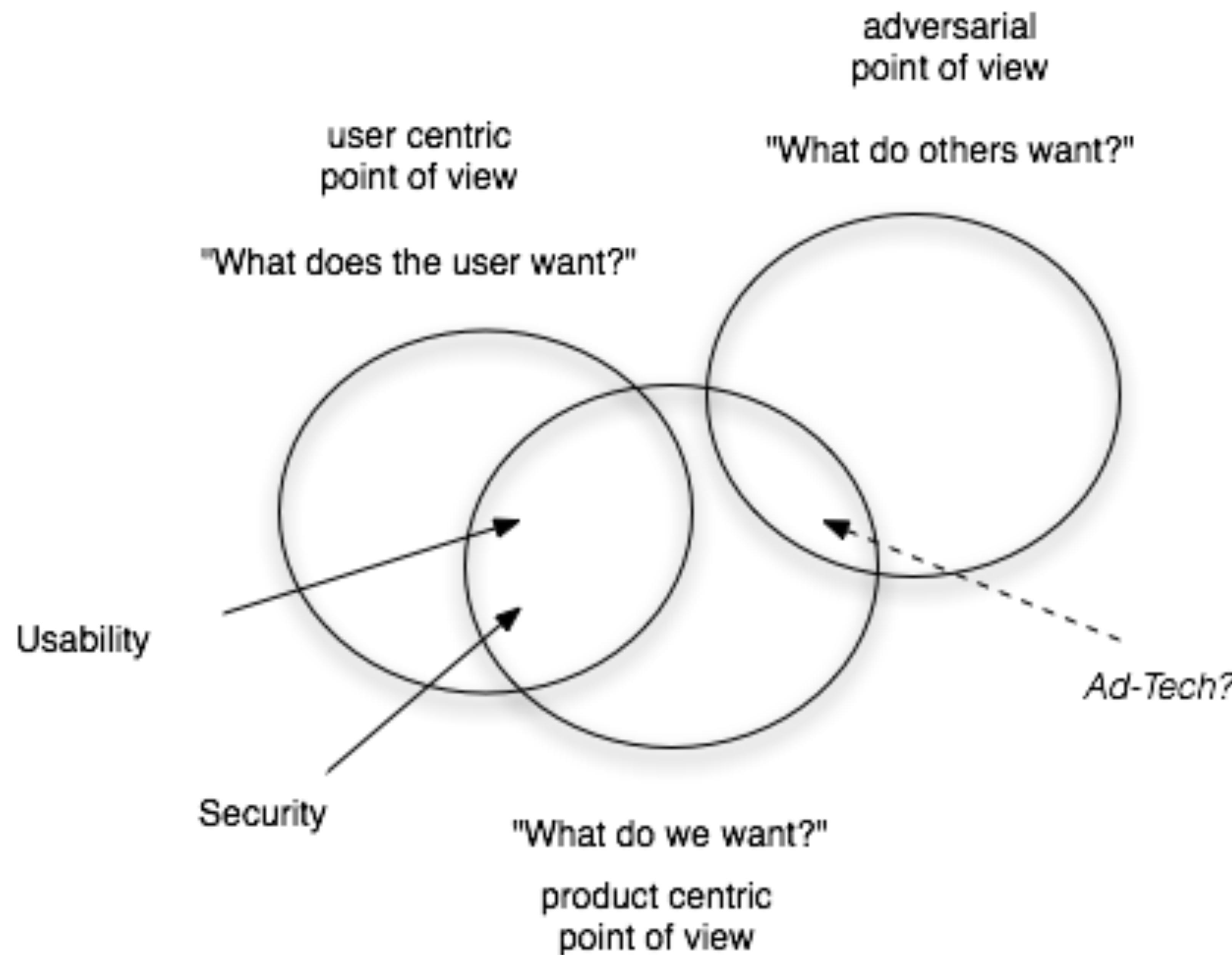
Scaling Down

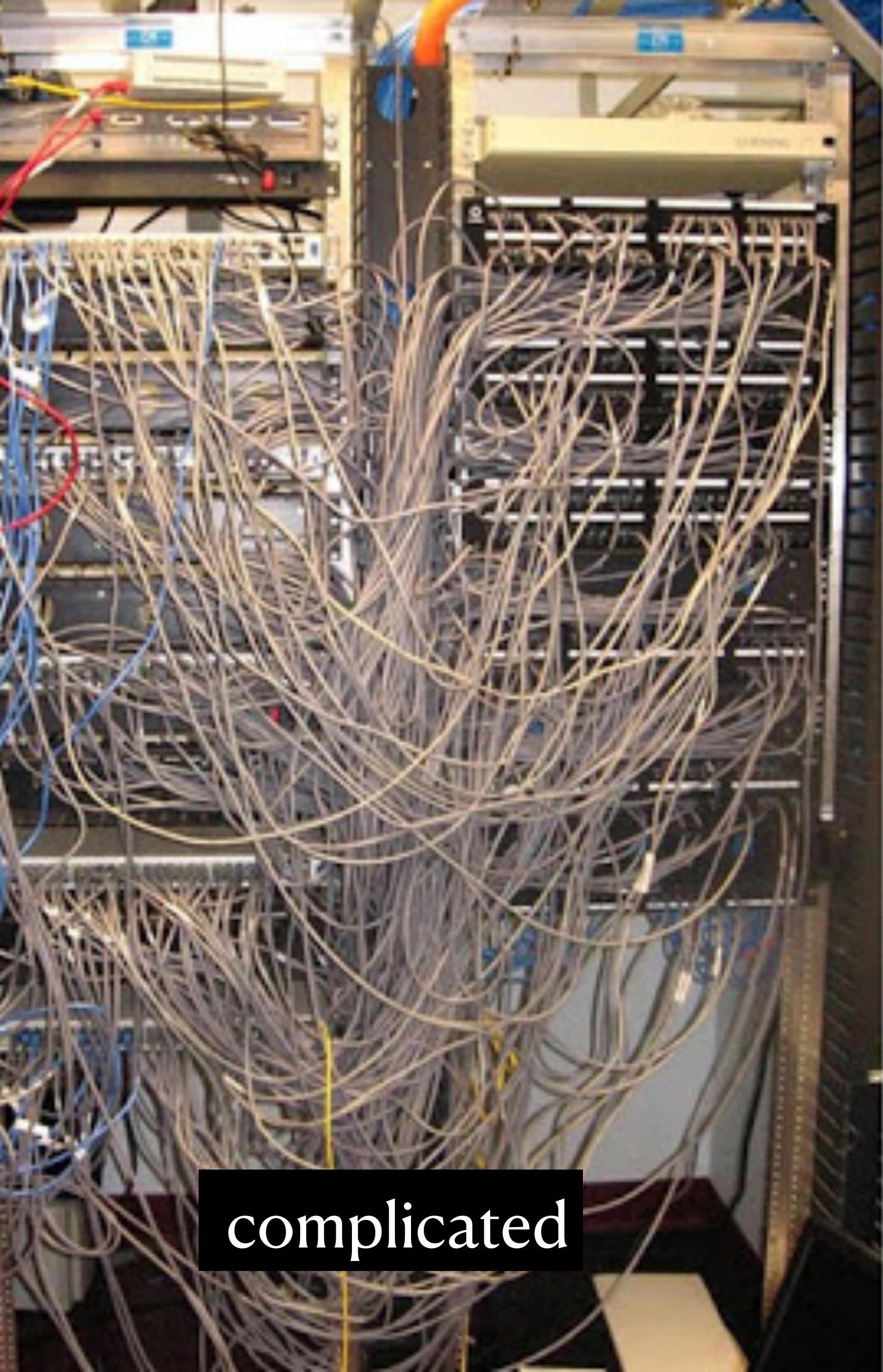


What People Think About Usable Security



<https://www.leeyat.com/usable-security>





complicated

complex

KISS

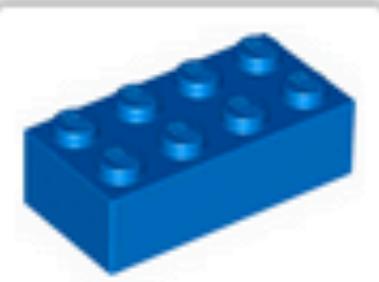


Keep
It
Simple,
Stupid

Brick 2 x 4

Item No: **3001**

Very Light Bluish Gray



Color
Images

3D/Lrg
Images



Item Info

Years Released: 1965 - 2021

Weight: 2.32g

Size: 2 x 4 x 1 in studs

+ My Inventory

[Add to My Inventory](#)

66364 Lots For Sale



CORE PRINCIPLES IN RESEARCH



OCCAM'S RAZOR

"WHEN FACED WITH TWO POSSIBLE EXPLANATIONS, THE SIMPLER OF THE TWO IS THE ONE MOST LIKELY TO BE TRUE."



OCCAM'S PROFESSOR

"WHEN FACED WITH TWO POSSIBLE WAYS OF DOING SOMETHING, THE MORE COMPLICATED ONE IS THE ONE YOUR PROFESSOR WILL MOST LIKELY ASK YOU TO DO."



IN THIS HOUSE, WE OBEY
THE LAWS OF
THERMODYNAMICS!

Hanlon's Razor

Warning: Cuts both ways!



Jan Schaumann
@jschauma

...

Why yes, Pareto's Principle rules everything around me.
Well, most things, anyway. About 80% or so. The rest are
harder to explain.

10:11 PM · Feb 10, 2018 · very-simple-tweet

13 Retweets 3 Quote Tweets 47 Likes

Mostly carp.





“You see there is only one constant. One universal. It is the only real truth. Causality. Action, reaction. Cause and effect.”



SysAdmins' favorite Laws

- Ockham's Razor:
"Of two equivalent theories or explanations, all other things being equal, the simpler one is to be preferred."
- 2nd Law of Thermodynamics:
"The entropy of an isolated system always increases with time."
- Hanlon's Razor:
"Never attribute to malice that which can be adequately explained by stupidity."
- Pareto's Principle:
"80% of consequences stem from 20% of the causes."
- Sturgeon's Law:
"90% of everything is crud."
- Murphy's Law:
"If it can happen, it will happen."
- Throw in some philosophy for good measure:
Causality: For every effect, there must be a cause.

Up next

- UNIX history and basics: <https://www.youtube.com/watch?v=3H7SQWTR6Dw>
- Homework assignments in detail
- Just enough git basics for this class
- Week 02: Storage Models and Disks
- Recommended exercises:
 - Consider the current most popular websites and Internet businesses or organizations. Try to find out details about their infrastructure and how it is maintained.
 - Research available classes and degree granting programs in the field of System Administration. Compare their contents to those of industry standard certification courses.
 - Determine the Unix commands you execute most frequently (for example via analysis of your shell's history file). Analyze the top three commands for their complexity and interfaces.