The Vienna Programme

A Global Strategy for Cyber Security

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About me

- President of the Magdeburg Institute for Security Research
- Editor of the Magdeburger Journal of Security Research
- Freelance Security Consultant
- ex-NetBSD developer, Hacker since 20 years
- B.A. Educational Science and Psychology
- Focus on Social Engineering, Security Awareness, Organizational Security



#include<disclaimer.h>

- This Talk is a Basis for Discussion.



The Problem

- IT emerges into more fields every day
- IT insecurity emerges into more fields every day
- Security is not a hot toppic :-(
- Let's change it.
- Let's create a strategy to do so.



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1. Strategy and Governance
2. Malware
3. Politics
4. Psychology of Security



On Cyber Strategy



- Tactics is the theory of the use of military forces in combat.
- Strategy is the theory of the use of combats for the object of the war.
- War is a mere continuation of policy by other means.
- *It may sound strange, but for all who know War in this respect it is a fact beyond doubt, that much more strength of will is required to make an important decision in strategy than in tactics.*

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Example

- CORE-2007-0219: OpenBSD's IPv6 mbufs remote kernel buffer overflow
- develop a patch
- roll it out
- patch the source and compile it
- install new version
- that's tactic, it does solve the IPv6 mbufs remote kernel buffer overflow
- but it does not prevent future buffer overflow



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On Cyber-War

how to reach goals: Cathedral vs. Bazaar



I love it when a plan comes together
Hannibal



No plan survives the first contact with the enemy - MacGyver

The Elders of the Internet

- We need some global kind of organization
- in all dimensions (technical, psychological, social, juridical, international law)
- some institutions already exist (BSI, ENISA)
- coordination is required (think of the United Nations)
- why not organizing like an open source project? (Bazaar)
- Wikipedia: offer a Wiki/Mailing List/Forum etc. for discussion
- NetBSD: steering committee, developer groups, mailing listes, sponsors for new developers, security officers
- Request for Comments: Jon Postel: be conservative in what you do, be liberal in what you accept from others



The Elders of the Internet

- involve *all* actors: international organizations, governments, political parties, citizens/users, developers, researchers, companies
- get some Second Order Cybernetics (discourse analysis, institutional analysis, governance etc., see Luhmann, von Foerster)

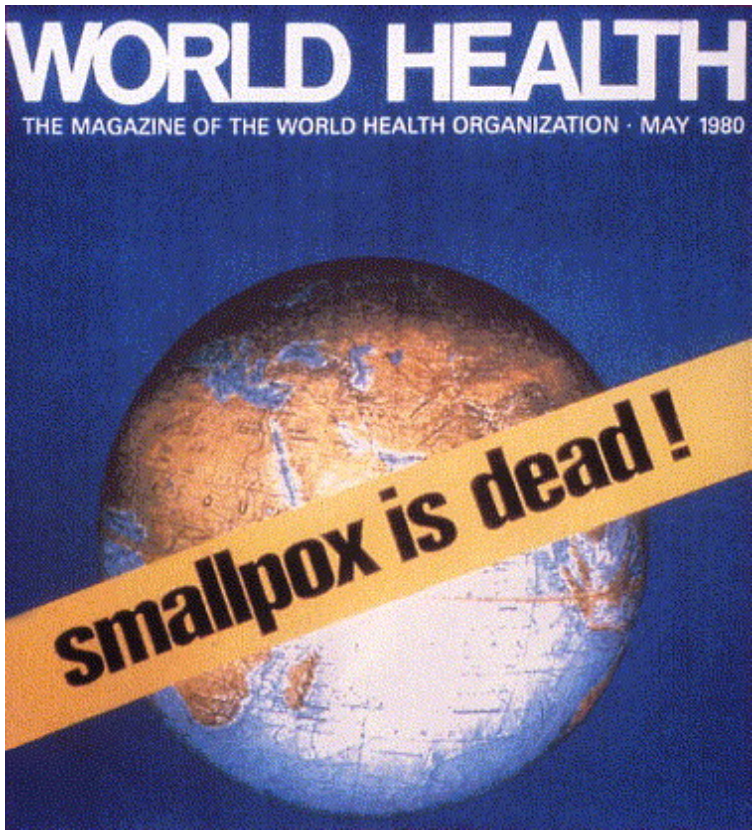


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Malware? What's that?



The World Health Organization eradicated Smallpox in the 1970s and Rinderpest in 2011

They had a strategy

Malware? What's that? Do you Remember?

- Let's eradicate Malware.
- Ain't that megalomanic? Sure, but we need big goals ...
- We know the complete »DNA« of every OS/Application, we can even change it!
- We can reverse engineer the DNA of malware or create our own examples in the lab!
- We can even mathematically verify the absence of vulnerabilities!
- We don't have to walk through the outback to get to our patients!
- Yet we still have Buffer Overflows since 1988 ...



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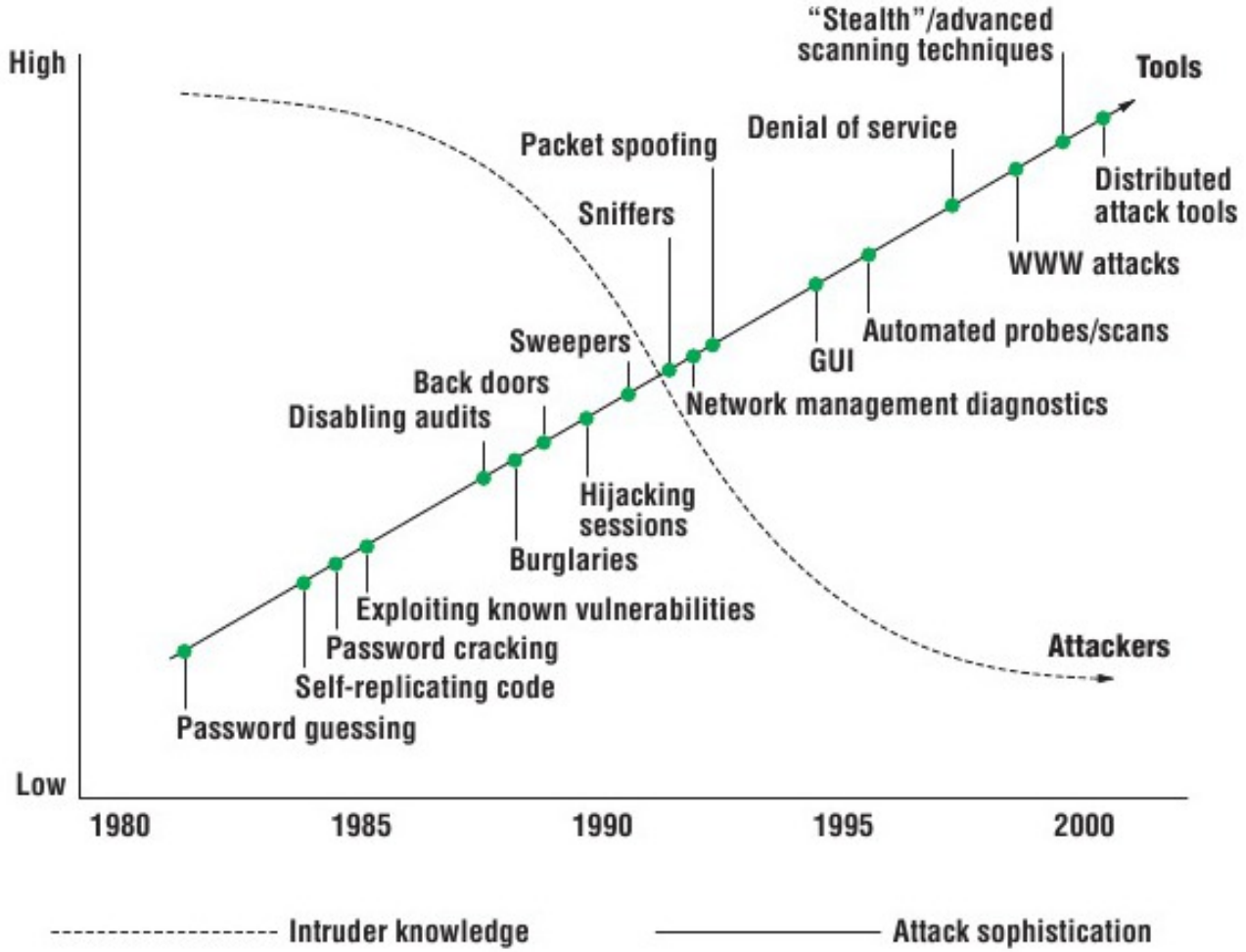


Malware? What's that?

- Identify all the simple Vulnerabilities and wipe them out
- have a look at the governance model of NetBSD and OpenBSD
- close at least the Skript Kiddie Vulnerabilities



Malware? What's that?



Resilience

- we won't get rid of all vulnerabilities, malware and so on
- we need resilience
- the capacity to recover quickly from difficulties
- several tools exist: sandboxing, AV scanner, IDS, Artificial Intelligence



Commercial Software

- prioritise security
- don't sell it as an add on: Security First
- talk to us, offer a path for responsible disclosure
- and act!
- customers have a lot of power ($$$)
- manufacterers are liable for their products
- car manufacturers have to recal malfunctioning cars
- aviation authorities monitor airlines and shut them down in case of emergency
- Has there ever been a recall for Operating Systems? Why not?
- Why do customers accept broken and FUBARed software?



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The Special Responsibility of the Expert

- hackers are experts, because of their knowledge and skills
- because of the knowledge, they have a higher responsibility (Joseph Weizenbaum)
- share the knowledge
- educate the politicians
- gain political influence
- talk to them – in their language
- Constanze Kurz (spokesperson of the Chaos Computer Club) was heard by the German Constitutional Court on the federal trojan
- depends on your culture/society/political system



Political Influence



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Psychology of Security

- Why Psychology?
- Humans act and make decisions, computers do only as told
- Programmers create Buffer Overflows and forget safety regulations (Ariane 5) ...
- Users choose weak passwords ...
- Admins forget to patch ...
- We have to influence how humans make decisions regarding IT security
- therefor we will use the ancient black art of psychology ...



Making Security Sexy

- How do I make Security »sexy«? $\rightsquigarrow$ Motivational Psychology
- The Holy Grail$^{[TM]}$ of Psychology
- a lot of research done, especially for Industrial Psychology, Leadership, Management
- motivation is the key of every action $\rightsquigarrow$ no motivation == no action
- motivation can be conscious or unconscious
- several theories of motivation



Theories of Motivation

- Maslow: Pyramid of Needs
- Herzberg: Two Factor Theory of Content
- internal vs. external Motivation
- external Motivation: Reward or Punishment
- internal motivation is the ideal way
- people have to want security on their own
- they have to focus on security
- Motivation is volatile



Sexy Security

- people only learn when they focus on something
- they focus on something that is important to them
- security has to be relevant to them
- this is a complex task: The User - An Unknown Being.
- Does he identify with his employer? (Maslow)
- What are his needs?
- Does he understand security? (Know How/Technical Skills)
- Can he integrate »security« into his mind set?
- What does his mind set look like? (Weltanschauung)



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Weltanschauung

- externalise the mind set of an user to examine
- »get a Core Dump from his Brain for Reverse Engineering«
- qualitative research has to be done
- Psychology, Sociology, Educational Science,
- biographization, autobiographic-narrative interview, hermeneutic spiral,
- cultural influence (gun control, death by fan in Korea)
- organizational influence (police vs. advertising agency)



Personality Traits

- every individual has personality traits which are stable
- several models exist
- Motives are stable and a well researched theory in psychology
- eg.: achievement motive, power motive, affiliation motive
- Big 5 Neo FFI: Neuroticism, Extraversion, Openness, Conscientiousness, Affability
- How do personality traits correlate with security aware behaviour?
- How do traits of an organisation affect security aware behaviour?
- How do person and organisation fit together? (Person Organisation Fit)



Didactics of Security

- Didactics: science of teaching theories and methods
- professionalization science of teachers
- general didactics and subject didactics (english, math, chemistry)
- required for teaching security aware behaviour
- *How do we teach security?*
- motivation is one (important) item
- theory of action the next



Security Aware Behaviour

- several theories of action exist: Taylor, »Fordism«, Hacker, Volpert, Wygotski, Piaget, Aebli
- describe how people act and solve complex problems
- well researched field in Industrial Psychology and TVET
- How do we teach security? Material? Methods?
- What do we teach?
- Whom do we teach? (Ellyptic Curve Cryptography for everyone?)
- development of curricula
- professionals are required to assess professional competences



Didactics of Security

- fundamental research of didactics has been done
- fundamental research of technical didactics has also been done
- apply it to IT security ASAP!
- professionalize IT security training
- depending on culture and educational system
- eg: IT security curriculum for IT professions in TVET in Germany
- mandatory security course for CS/EE/Mechatronic students



Can we fix it?



What has to be done?

- talk with each other
- start a discourse
- get coordinated
- set up a road map with strategic goals
- work to reach those goals
- reflect what we are doing
- react



Book



Sambleben, J. und Schumacher, S. (Herausgeber). (2012). Informationstechnologie und Sicherheitspolitik: Wird der dritte Weltkrieg im Internet ausgetragen? Norderstedt: BoD, ISBN