Build yourself a risk assessment tool

The plan:
25 min theory
20 min practice
5 min questions

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Do you need your own tool?

- **short answer** - maybe *not* - if you're happy with what existing methodologies & tools offer
- **long answer** - maybe *you do* - if you're left alone with it and don't know where to start and feel like you might want to have more freedom

disadvantages of ready-made tools

- (many) single **user**, single **assessment case**, not integrated
- those sophisticated ones, based on web, for multiple users
  - may be expensive, suited for full-time experts (OCTAVE, Proteus)
- those coded in java or using desktop db runtimes - very much **static**
  - you might **depend on** provider for any design and maybe also content **changes**

Advantage of own, custom-made tool

you have the **full control** over

- the **functionality** and
- the **content**
- you can truly shape the tool **around your own needs**

it can become more than just a risk tool:

- it can be part of an overall **ISMS**
- combining **all** internal **knowledge** about status of
  - information security in your company

if created with accessible technologies (HTML, CSS, javascript, PHP)

- chances are you **will not get stuck** with it
- **never obsolete** since everything is under your nose

What this presentation is not about

breakthrough in information security risk assessment (RA)

- it is not about **rightfulness** of any methodology
- there are tons of **scientific papers** to read
  - unfortunately, what one can do with them is **quite limited**

although research is very **interesting**

- it is of little help when doing RA in a real company, e.g.
  - *if you cannot agree who is responsible for an asset...*
  - *or, who has to approve the access..*

the real everyday security struggle is rather different from books

- it takes place in your own, **specific** company
  - with **different set** of conditions, limitations and skill-sets

What this presentation is about

there is no problem with **understanding methodologies**, yet

- it is really not that easy to **start with** any of them
- there is no single best approach to RA for everyone

for RA to be **practical** we need to

- **simplify** things as much as we can

the **pragmatic** approach is the one

- which is **good-enough**, meaning
  - quick - can be performed by **non-RA specialists**
  - focuses only on what really **makes-or-breaks** the security in a given case
  - repeatable, reproducible and stable over time

The journey or the results?

exaggerating a little we could say the **real purpose** of the RA

- is not the **result** but the **journey** itself

the journey during which **we learn** what didn't know:

- about **our environment** (people, process, technology)
- that instead of relying on few key assumptions, like
  - people are **following standards** and procedures, or
  - vendors are **patching** our systems
  - sometimes it is worth **investigating** deeper

by repeating the process, performing RA consistently

- we learn which security measures **make sense**
- which to **embed** into **ISMS** and which keep out for specific cases

Setting the ground

a risk assessment can be performed at several levels of details

- **business** (high) - to map business or organizational risks
- **process** (medium) - compliance with best practices or international standards for info security management
- **technical** (low) - aiming at **threat modeling** (such as STRIDE)

some opinion-making methodologies (NIST SP 800-30)

- assume that the technical level deals both **process** and **technical** risks (selecting technical controls, setting actions)

when we need to stick to **known compliance frameworks**, such as

- **ISO/IEC 27001**, COBIT, PCI DSS or SOX
- most likely we end up working with **people**, **process** and **technical** risks

List of best known tools

For those still looking for **the ultimate tool**

- COBRA, CORAS, CRAMM, EBIOS, FAIR, FRAP, GSTool, MEHARI, CORA, ISACA COBIT 5, ISRAM, ISF IRAM, MAGERIT-PILAR, OCTAVE, Proteus Enterprise, RiskSafe, RiskWatch, Verinice

In 2014 **Gartner** compared the following **methodologies/tools**:

- FAIR, ISACA COBIT 5, ISF IRAM, ISO/IEC 31000:2009, MAGERIT, NIST SP 800-30, OCTAVE Allegro, and RiskSafe by Platinum Squared Technologies (which is a SaaS-based approach)

Gartner‘s summary:

- "*choose the risk assessment methods that are the **best cultural fit** for your organization*."

Key definitions

despite all that scholars know about **risk** it remains a **vague** and somewhat **confusing** concept.

- "Prediction is very difficult, especially about the future." Niels Bohr
- "The idea that the future is unpredictable is undermined every day by the ease with which the past is explained." Daniel Kahneman

most of our past experience (**incidents, checks, audits)** demonstrates that

- even the simplest **assumptions** in RA can be wrong
- the expected (routine) controls and measures are ineffective or inefficient

a RA is about best collective judgment

- "Managing information security risk, like risk management in general, is **not an exact science**. It brings together the **best collective judgments** of individuals and groups within organization." (NIST SP 800-39)

What we need to build our tool

approach - we might follow a known methodology

- ISO 27001 is considered a **top-down**, **technology-neutral**
  - most people know it, we can compare and benchmark against others

completely own risk methodology - should have a reason

minimal functionality

- catalogue of assets
- catalogue of threats
- vulnerabilities linked to threats
- controls linked to vulnerabilities

nice-to-have features

- list of risks with linked RTPs
- live repository of **security references** (policies, procedures)
- incidents and audits stats
- reporting, charts, exports

Sources of information on TVCs 1/3

Books

- Information Security Risk Assessment Toolkit, Practical Assessments through Data Collection and Data Analysis M.R.M.Talabis, J.L.Martin, 2013 Elsevier

Source of assets

- your own (automated) inventory system
- business architecture systems (such as ARIS-BP)

Source of threats

OSA compared threat catalogues in 2008 (http://opensecurityarchitecture.org)

- **BITS** Kalculator (600 Ts), **ISF IRAM** (39 Ts), **NIST SP 800-30**
- **BSI** (Bundesamt für Sicherheit in der Informationstechnik) (370 Ts), **ISO 27005** (43 Ts)
- **simplicable.com** - The Big List of Information Security Threats, John Spacey, Simplicable, December 08, 2012

Sources of information on TVCs 2/3

Source of vulnerabilities

- some good generic examples which can be adapted or expanded from are
  - **ISO 27005**
  - **Information Security Forum** (ISF IRAM tool)
  - **NIST SP 800-53**
- other (internal) sources
  - vulnerability assessments, penetration testing, audit reports, security incidents
- maybe one can get **inspired** also by technical vulnerabilities as maintained via CVE (MITRE, DHS U.S.)
  - http://web.nvd.nist.gov/view/vuln/search-results?query=authorization+bypass&search_type=all&cves=on

Sources of information on TVCs 2/3

Source of controls

- **ISO 27002** (114 Cs)**, BITS** (219 Cs)
- **NIST SP 800-53** r4 (163 Cs)
  - catalog of security and privacy controls to protect organizational operations (including mission, functions, image, and reputation), organizational assets, individuals, other organizations
  - NIST say the controls are intentionally **technology-neutral** and **policy-neutral**

- **OSA** - http://www.opensecurityarchitecture.org/cms/library/0802control-catalogue
- **OWASP**
  - (**web**) application controls (11 subcategories, 45 controls)
  - OWASP ISO/IEC 27034 Application Security Controls Project (only starting)

Which open-source to use?

any one that is really **open**

– source code made available with a license in which the copyright holder provides the rights to study, change and distribute the software to anyone and for any purpose

- allowing to see how things are done from inside and
  – not limiting what you can do with your own data
- supports scripting, public repositories and rapid deployment
- has a huge installed base (with forums, groups)
- mastering it does not require a MIT degree

two of many possible directions for a **home-made** risk tool

- a **wiki** variant (twiki, dokuwiki, mediawiki, **tiddlywiki**)
- **CMS** system (Drupal, Joomla, Alfresco, ocportal, tiki)

Why tiddlywiki?

"*the simplest online database that could possibly work*"

Ward Cunningham (on **wiki** concept)

- free, low footprint and easy **operability**
- user needs only a web browser and a username (to sign posts or to login where needed)

dynamics of data from the **user side**:

- end-user himself creates logical relationships between pieces of data the way he/she wants it

all done **from within a web browser**

- no need to work with database schemas, entities, relationships
- **records** can contain other records or even **scripts**

About the live demo of the tool

one important question is

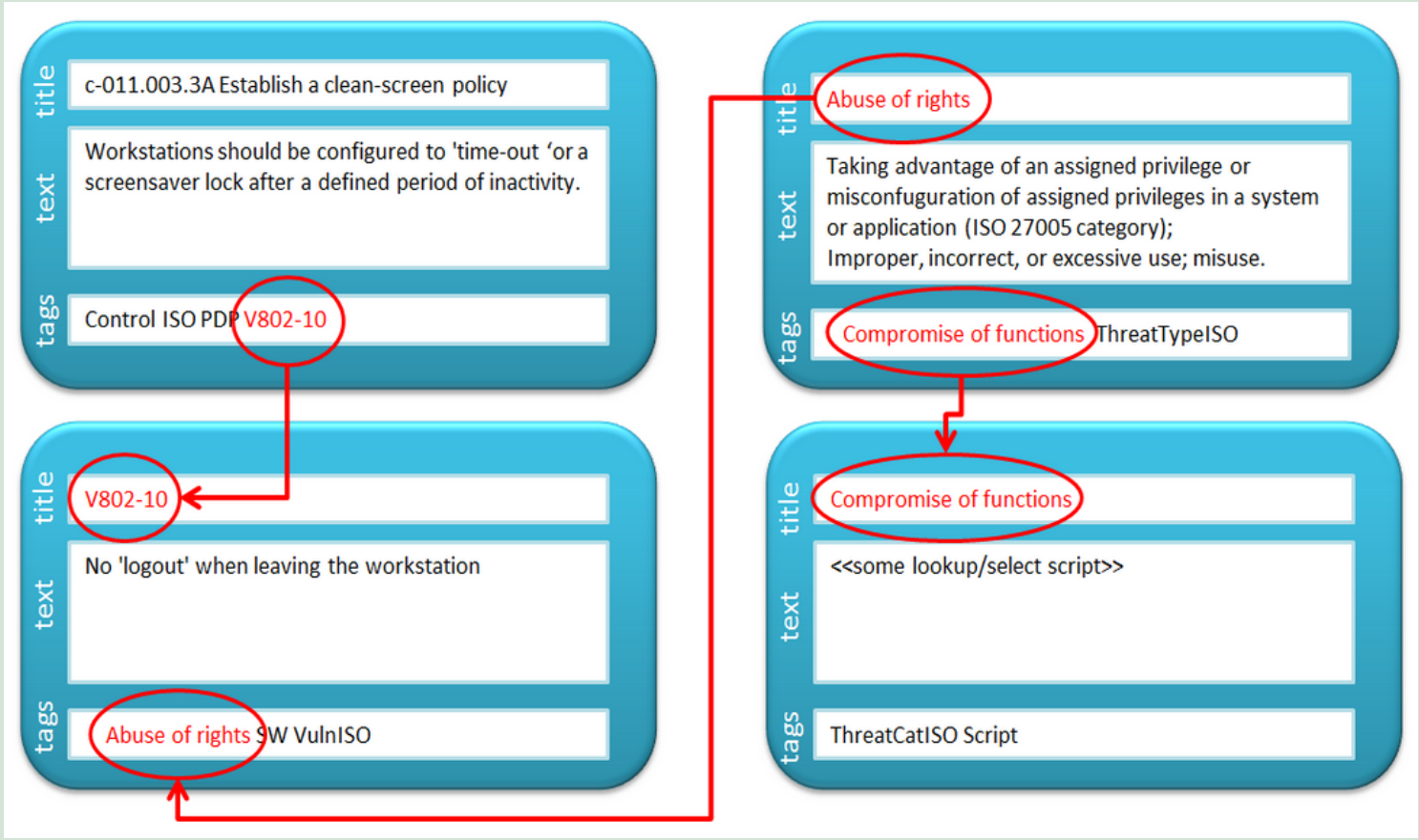
- how much **automated calculation** do we want in the tool?
- even the most **sophisticated formulas** do not make risk calculation “better“
- because the **key is knowledge** of
  - context, make-or-break points,
  - history: incidents, findings, and actual status of controls

my experience (e.g. with IRAM tool by ISF, done in Excel)

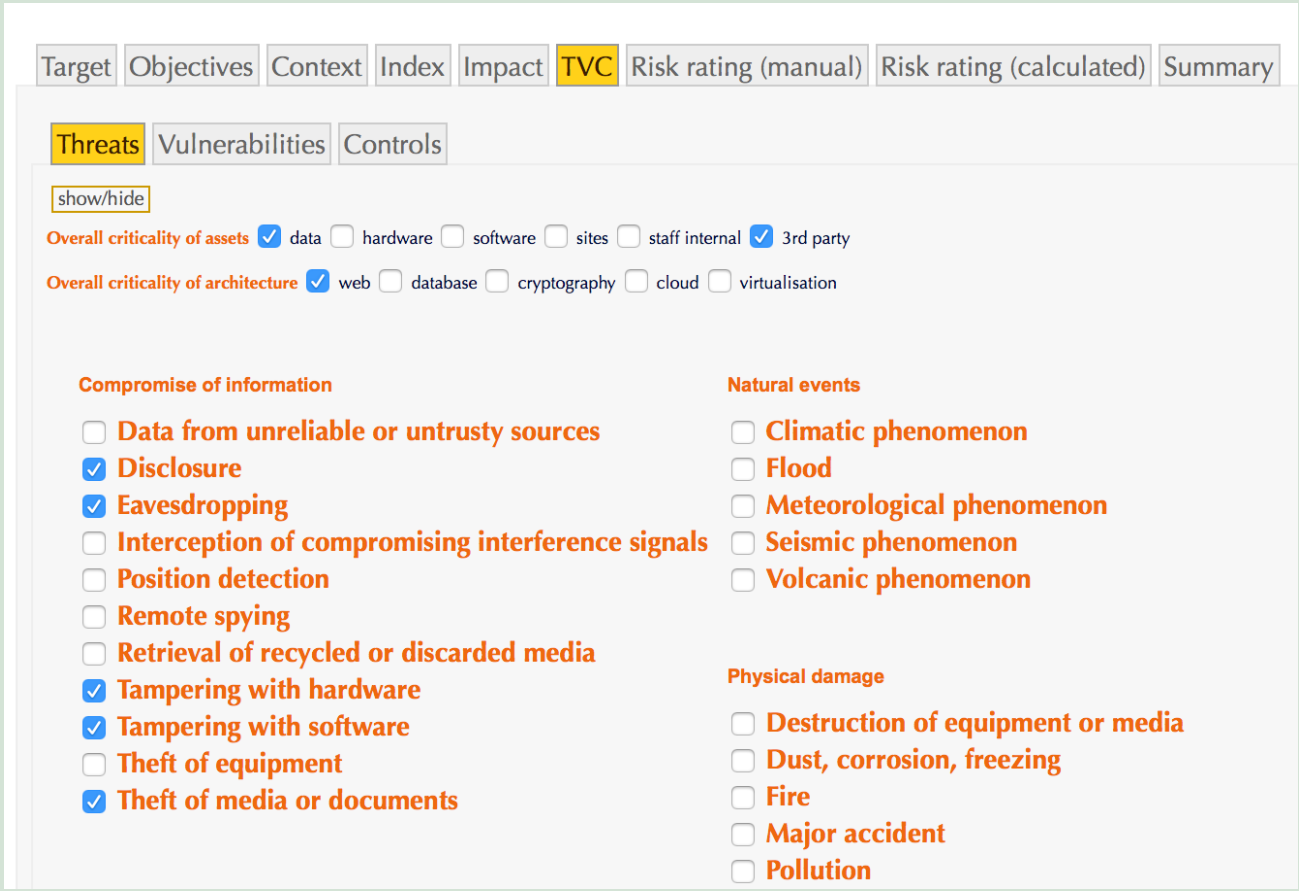
- if everything is auto calculated
- w/o possibility of a (collective) **human verdict**
- people tend to "play" with the tool until the issues “disappear”

the live demo is an **experimental** version of the tool, a mix of (mostly) real and (some) random data

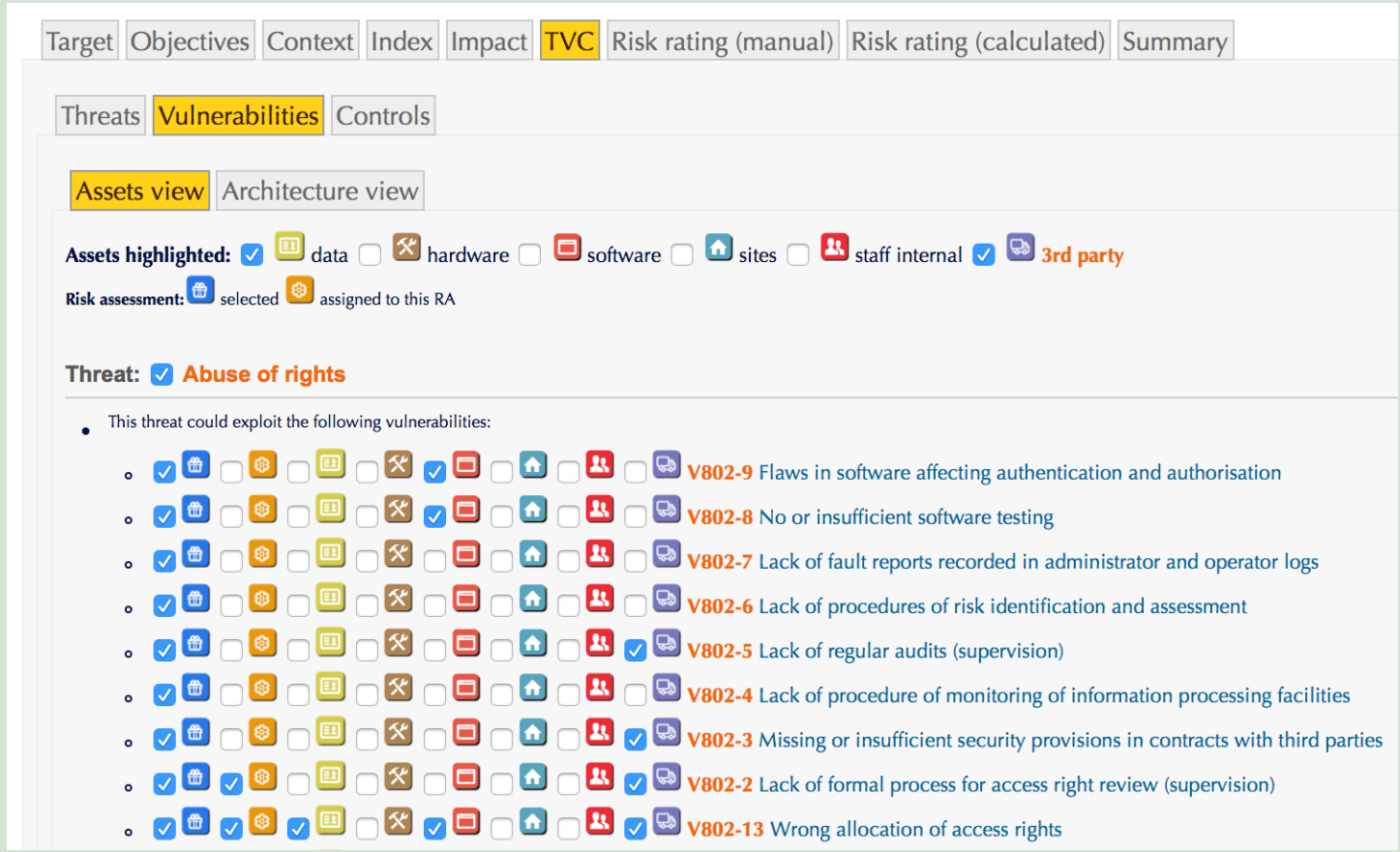
The “engine” behind



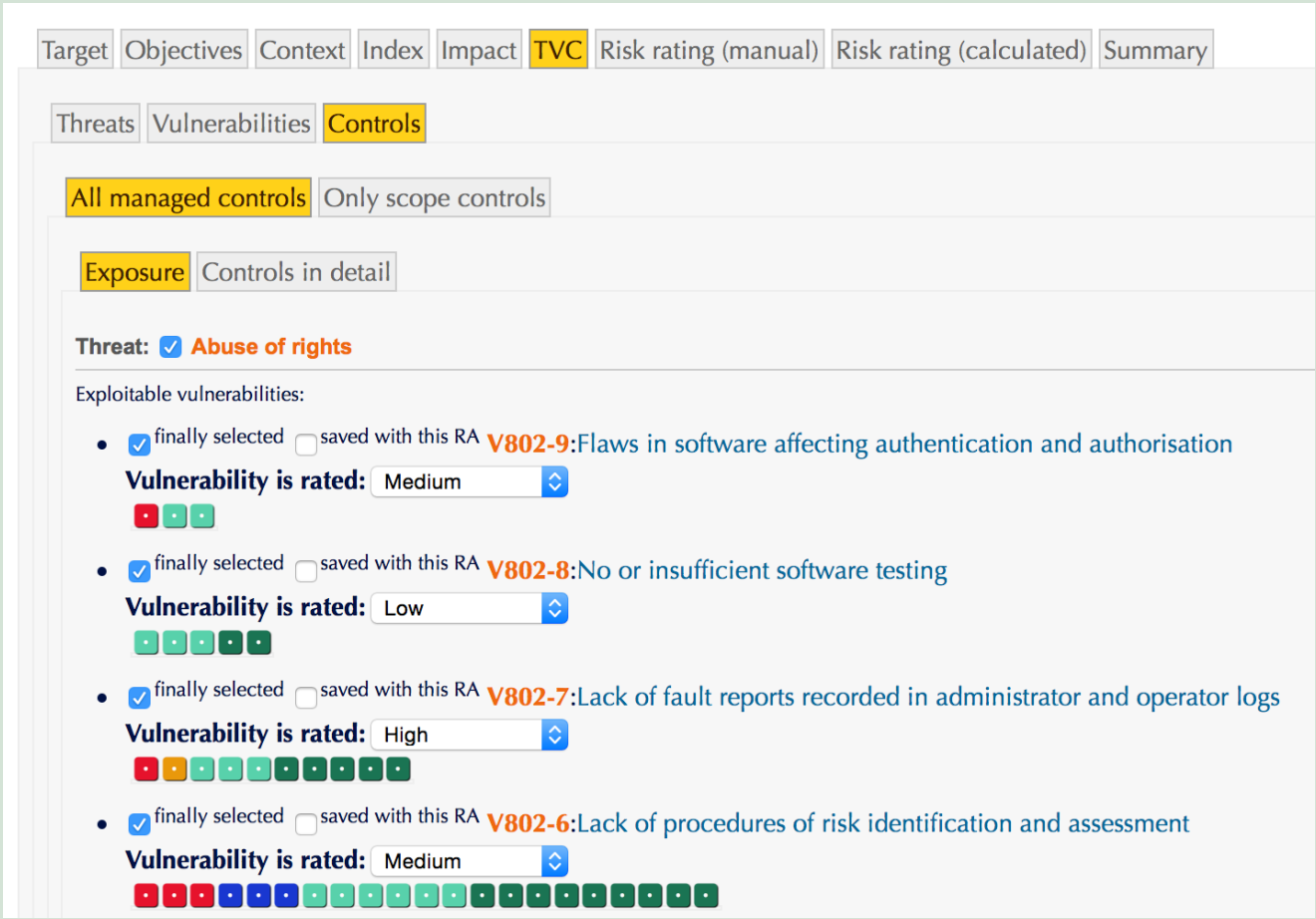
RISSCON - printscreens 1/3



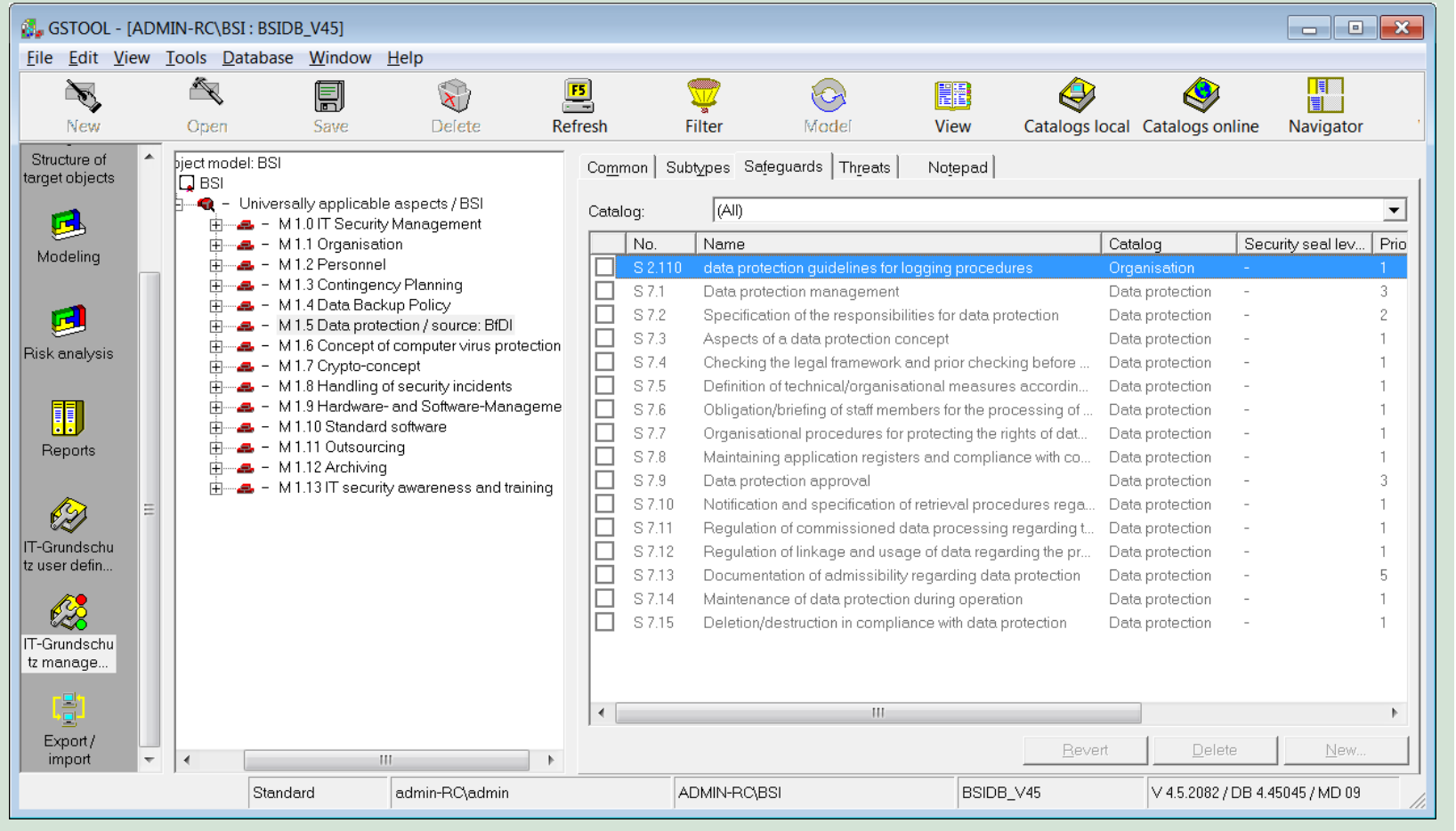
RISSCON - printscreens 2/3



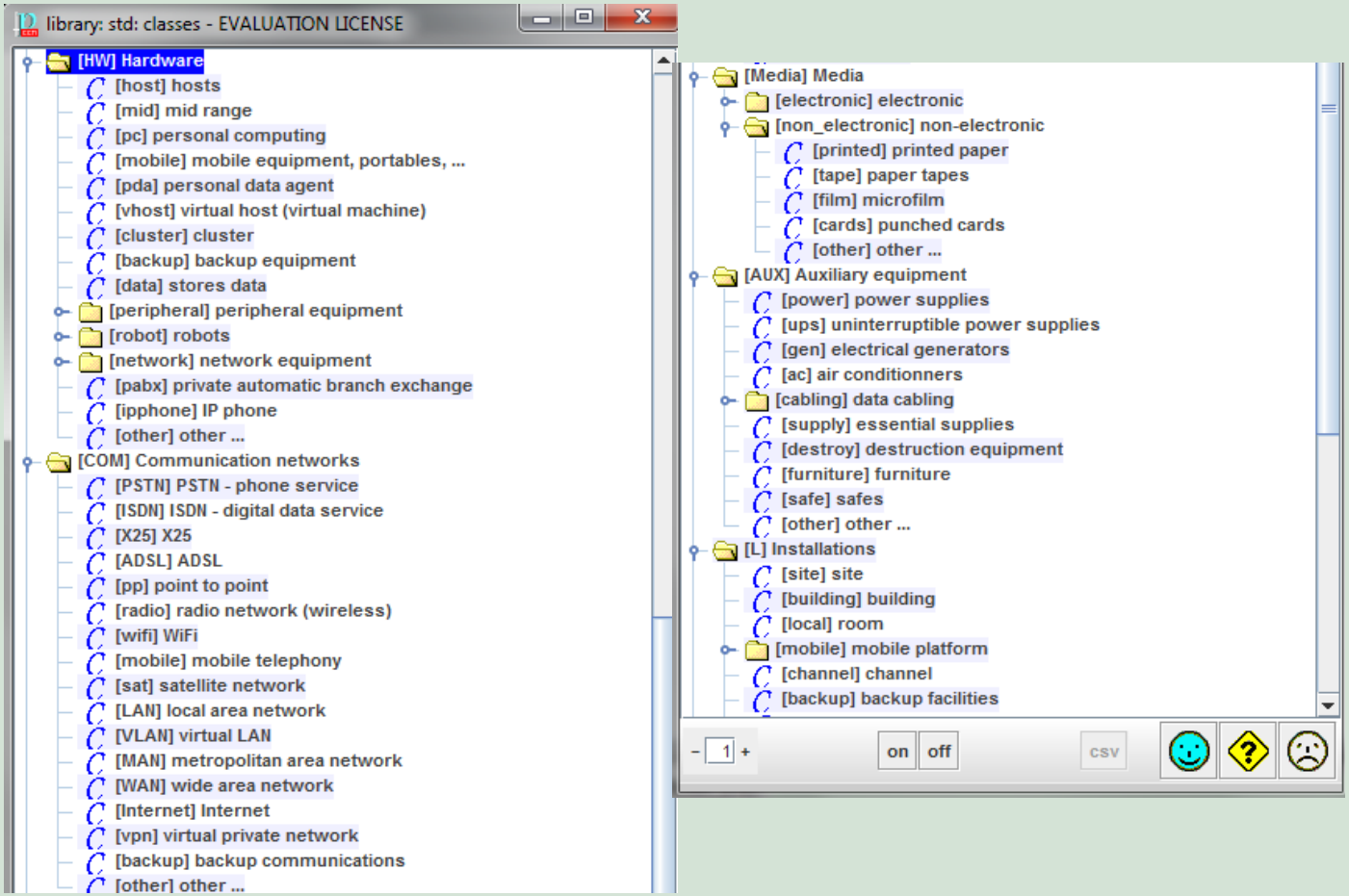
RISSCON - printscreens 3/3



GSTool (Bundesamt für Sicherheit in der Informationstechnik, Ger)



Magerit-Pilar (National Intelligence Centre, Spain)



NIST SP 800-53

TABLE D-2: SECURITY CONTROL BASELINES[92]

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
Access Control					
AC-1	Access Control Policy and Procedures	P1	AC-1	AC-1	AC-1
AC-2	Account Management	P1	AC-2	AC-2 (1) (2) (3) (4)	AC-2 (1) (2) (3) (4) (5) (11) (12) (13)
AC-3	Access Enforcement	P1	AC-3	AC-3	AC-3
AC-4	Information Flow Enforcement	P1	Not Selected	AC-4	AC-4
AC-5	Separation of Duties	P1	Not Selected	AC-5	AC-5
AC-6	Least Privilege	P1	Not Selected	AC-6 (1) (2) (5) (9) (10)	AC-6 (1) (2) (3) (5) (9) (10)
AC-7	Unsuccessful Logon Attempts	P2	AC-7	AC-7	AC-7
AC-8	System Use Notification	P1	AC-8	AC-8	AC-8
AC-9	Previous Logon (Access) Notification	P0	Not Selected	Not Selected	Not Selected
AC-10	Concurrent Session Control	P3	Not Selected	Not Selected	AC-10
AC-11	Session Lock	P3	Not Selected	AC-11 (1)	AC-11 (1)
AC-12	Session Termination	P2	Not Selected	AC-12	AC-12