Michael Waidner
(wmi@zurich.ibm.com)
IBM Zurich Research Laboratory
CH8803 Rüschlikon -- Schweiz

Secure Electronic Marketplace for Europe

OCG Arbeitskreis "Electronic Commerce"

Wien, 20. November 1998

Outline

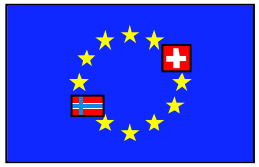
- What is SEMPER?
- Reasoning behind design
- Glimpse on the architecture

More information:

- See <http://www.semper.org>
- Final Report, LNCS Springer-Verlag, early 1999

What is SEMPER?

SEMPER



acts

- European R&D Project, 1995-1998
  - ~ 30 people, 20 partners, lead by IBM
  - ~ 13.000.000 CHF
  - EU ACTS Programme: 50% EU & CH, N
- Objectives
  - secure B2B/B2C/P2P e-commerce
  - coherent, complete, extensible framework
  - leitmotif: fairness and multi-party security
- Results:
  - architecture & protocols for secure e-commerce
  - SEMPER electronic commerce agreement
  - prototype, trials & evaluations
  - demonstrator: Fair Internet Trader

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Consortium

Service provision

- Otto Versand
- Eurocom
- Fogra
- Maris

Banking

- Europay
- Commerzbank

Telecom operators

- France Télécom
- KPN Research
- Intracom

Social sciences

- Freiburg Univ.

Security engineering

- Cryptomathic
- CWI
- Digicash
- GMD
- IBM
- r^3
- SINTEF
- Dortmund Univ.
- Saarbrücken Univ.

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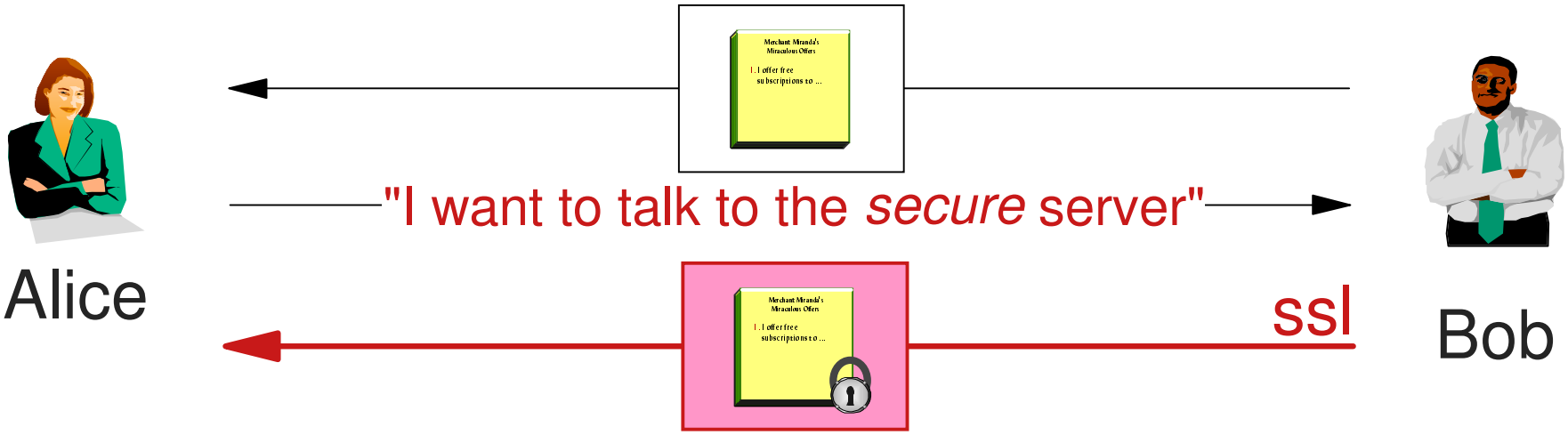
Current situation



Certificate really on "Bob"?
Issueing CA trusted? And: so what?

"Now I'm talking to Bob!"

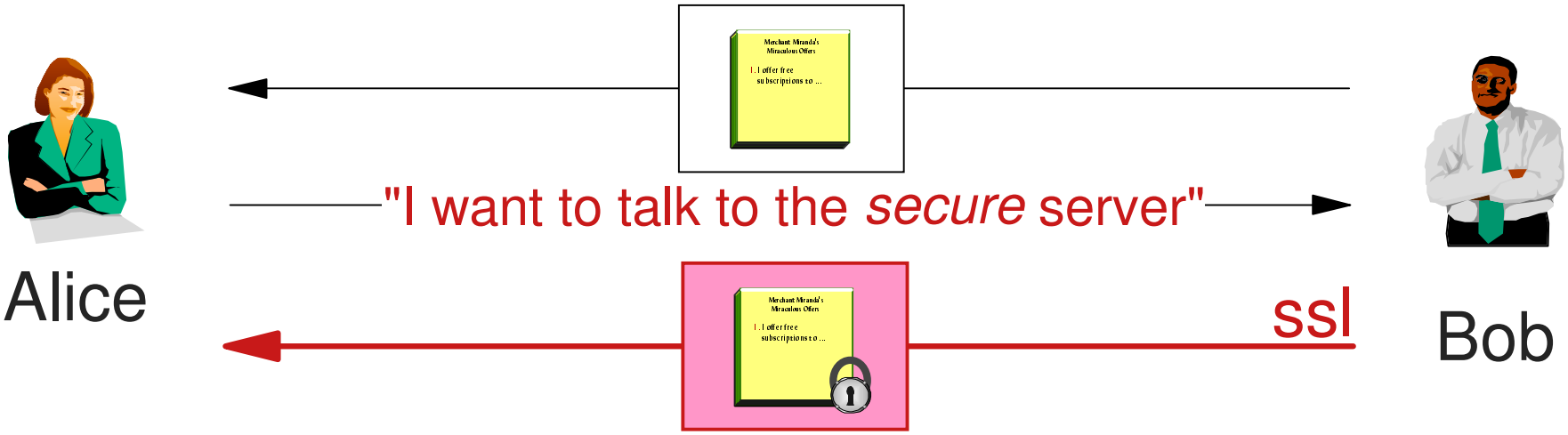
US export-controlled crypto?

"My messages are secure!"

"If he cheats me I can go to court"

SSL is transparent
to the application,
thus, *no signatures!*

Current situation



User interface + SECA,
Liability Cover Certificates

Certificate really on "Bob"?
Issueing CA trusted? And: so what?

Cryptography made
in Europe

US export-controlled crypto?

Secure documents,
not (just) secure connections.

SSL is transparent
to the application,
thus, *no signatures!*

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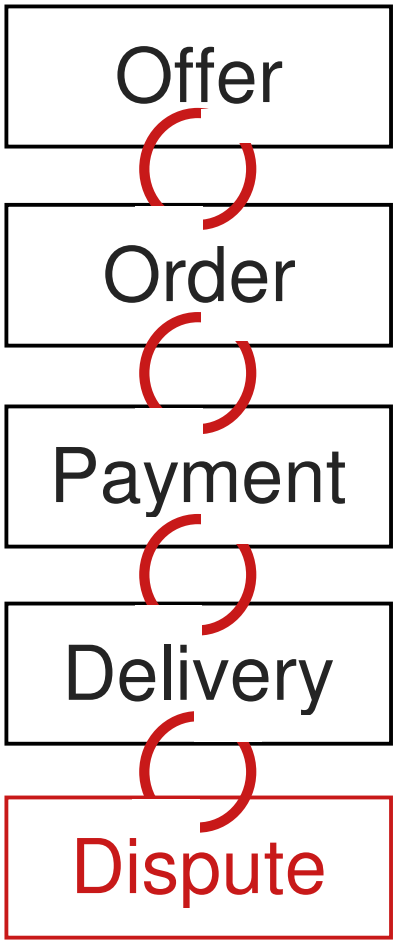
Processes, not just steps



- *Processes* are the entities that need to be trustworthy, not (just) the single steps.
- Security requirements like *anonymity cannot* be fulfilled on the step-level.
- Authorization policies naturally depend on processes.
- *Small* number of *generic, evaluated and certified* business processes are needed.

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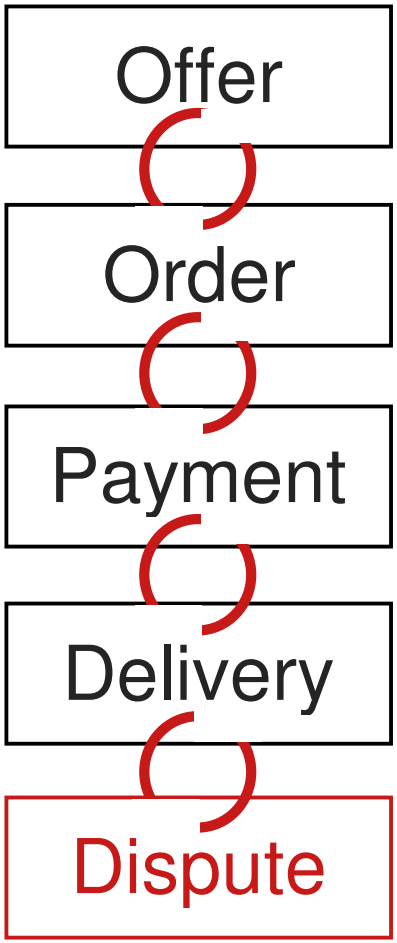
Processes, not just steps



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Business Applications

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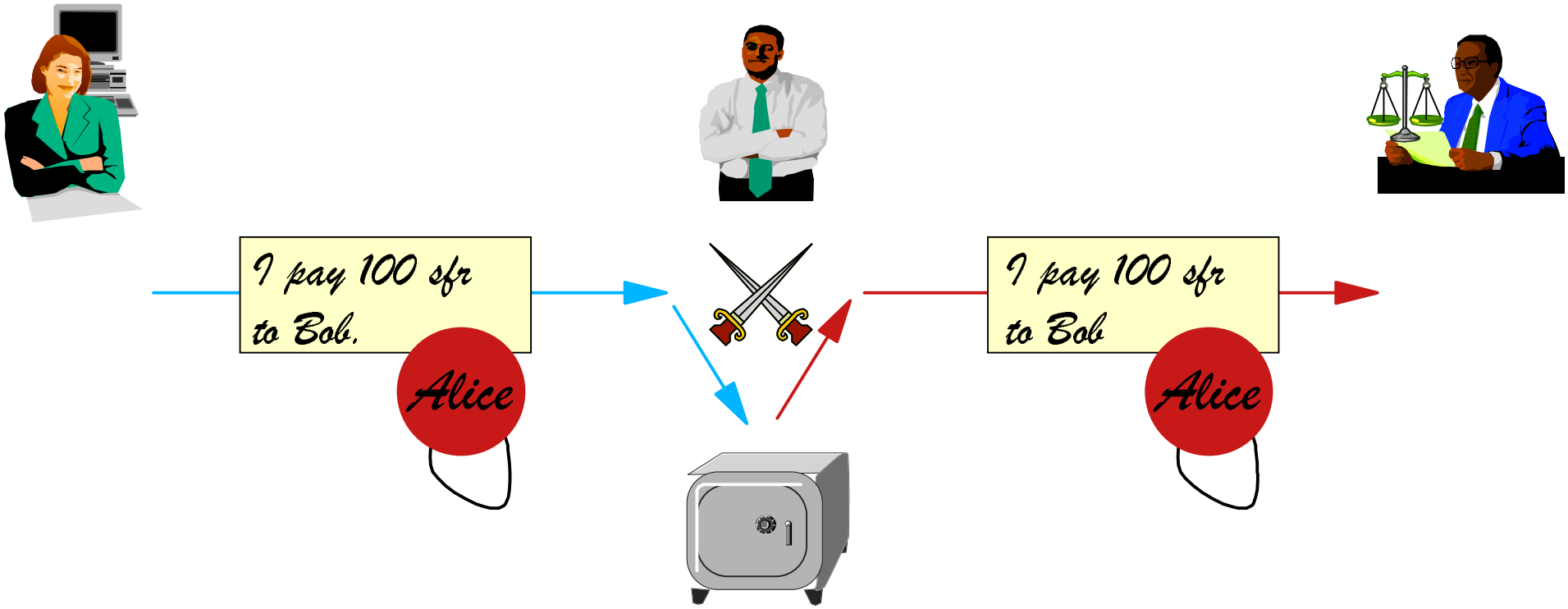
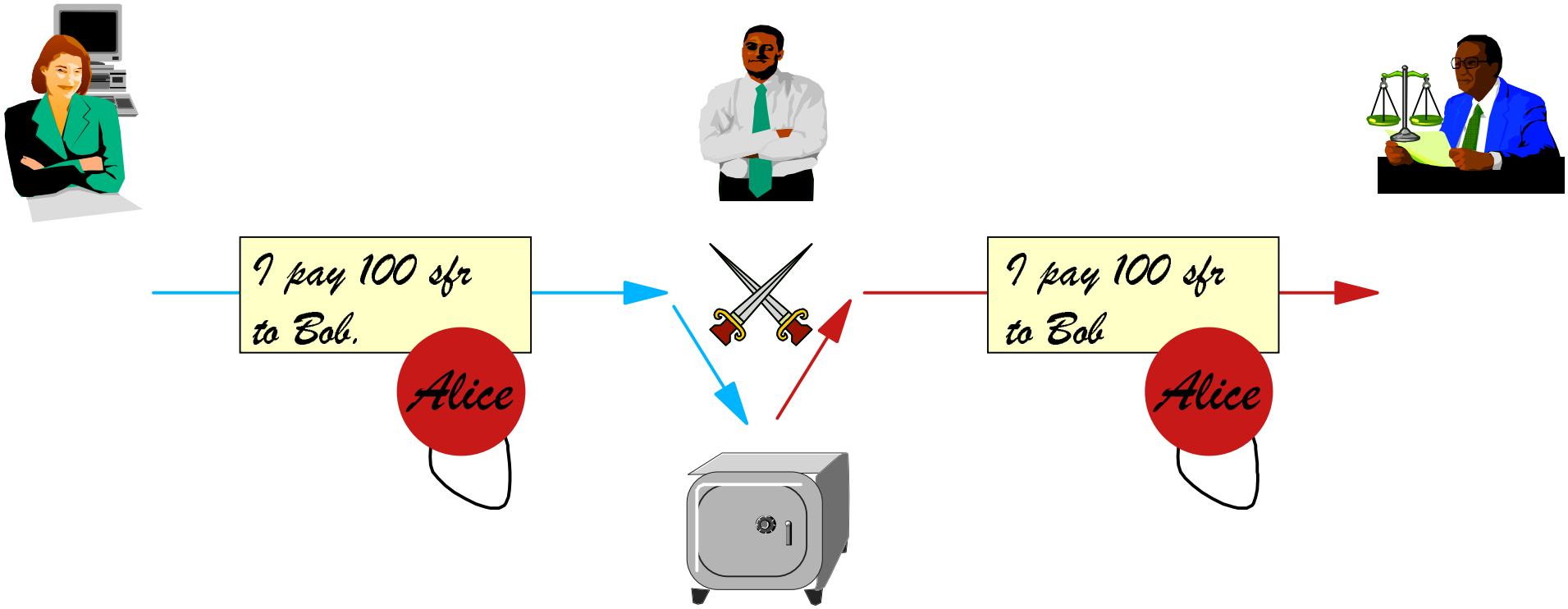
Dispute handling



Intended run of a payment system: SET, ecash, ...

Does not exist in existing payment systems, e.g., SET!

Dispute handling



Intended run of a payment

Does not exist in existing systems, e.g., SET!

Deal & transaction browser, dispute interfaces for payments

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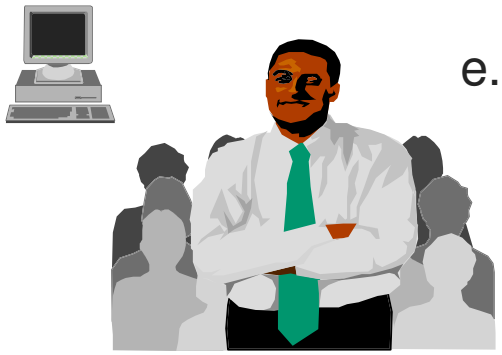
Multi-party security



e.g., Kerberos

e.g., SET/iKP

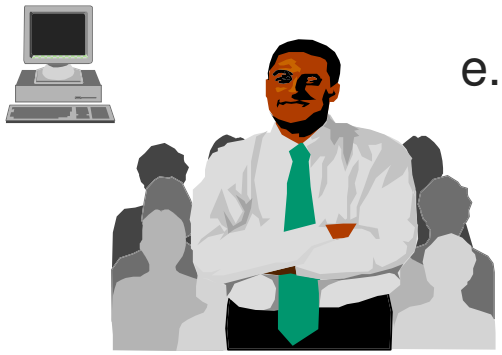
Centralized trust

- everybody's security is based on trust in security admin

Multi-party security

- make trust assumptions explicit; don't require to put trust in opponents
- minimize trust requirements
- distribute trust on many TPs
- leave some choice whom to trust

Multi-party security



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Symmetric design, all security requirements can be satisfied locally

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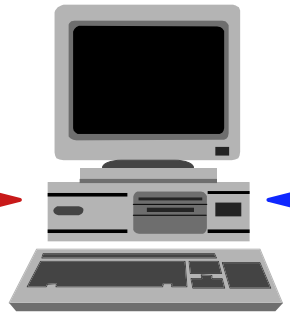
Trusted computing base

virus
Trojan horse

applications with
security holes

PC operating systems
without much security
(and with holes, too)



~~store and use secret~~
~~signature end enryption keys,~~
~~control what is signed~~

\+

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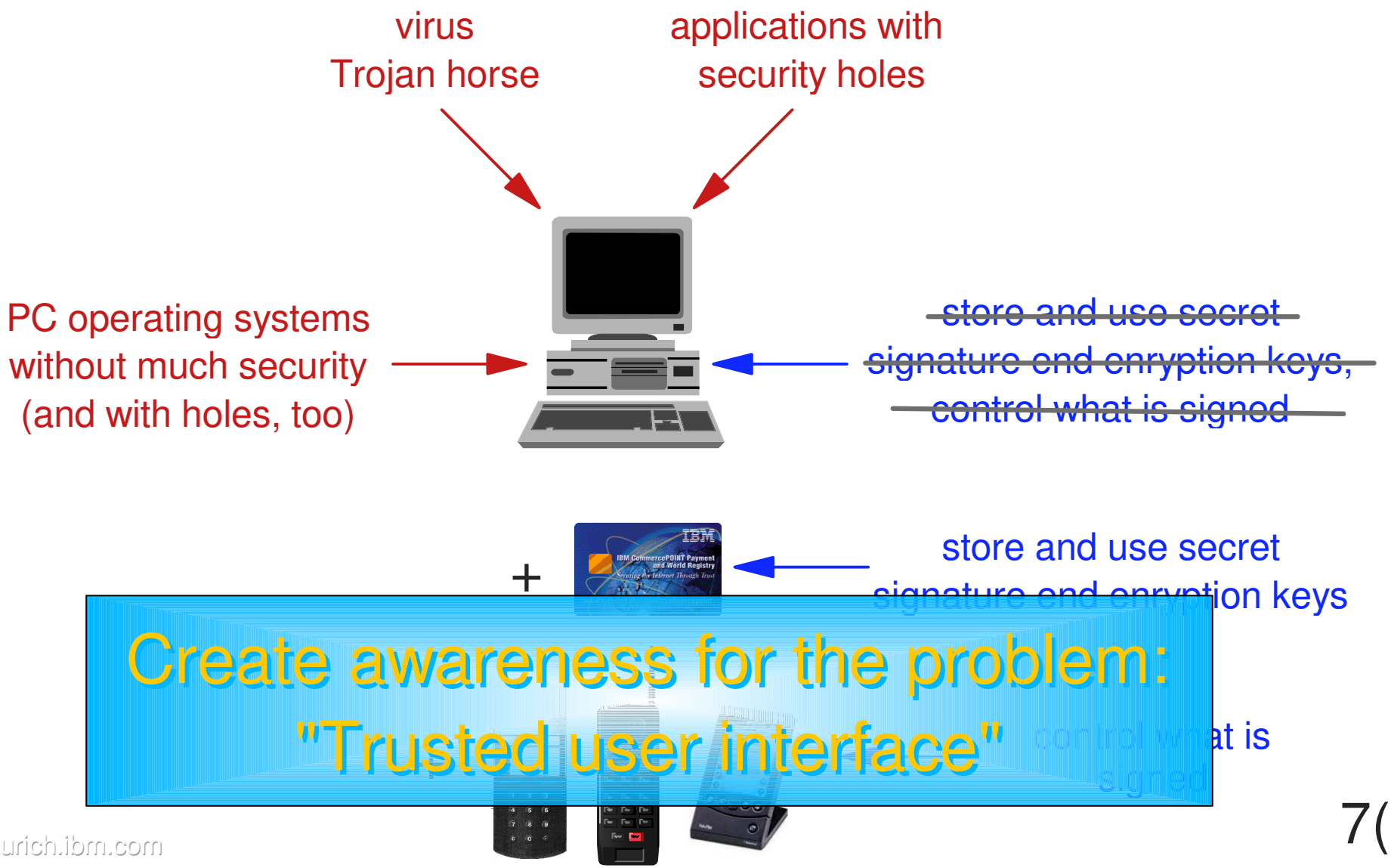
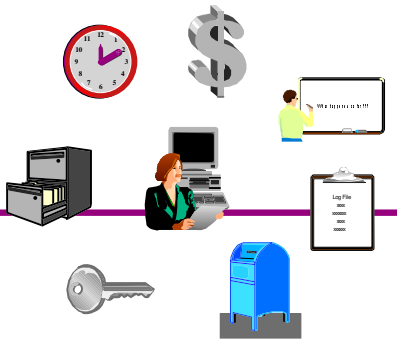
Trusted computing base



What are the steps?



Buyer

Code loading

Negotiation

Contract

Delivery

Payment

Merchant

or

Dispute

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What are the steps?

Authentication
Confidentiality
Non-repudiation
Fairness

Buyer

Request for offer →

← Signed Offer

Signed Order →

← **Goods**

Receipt →

Money →

← Receipt

Authentication
Confidentiality
Non-repudiation
Fairness

Merchant

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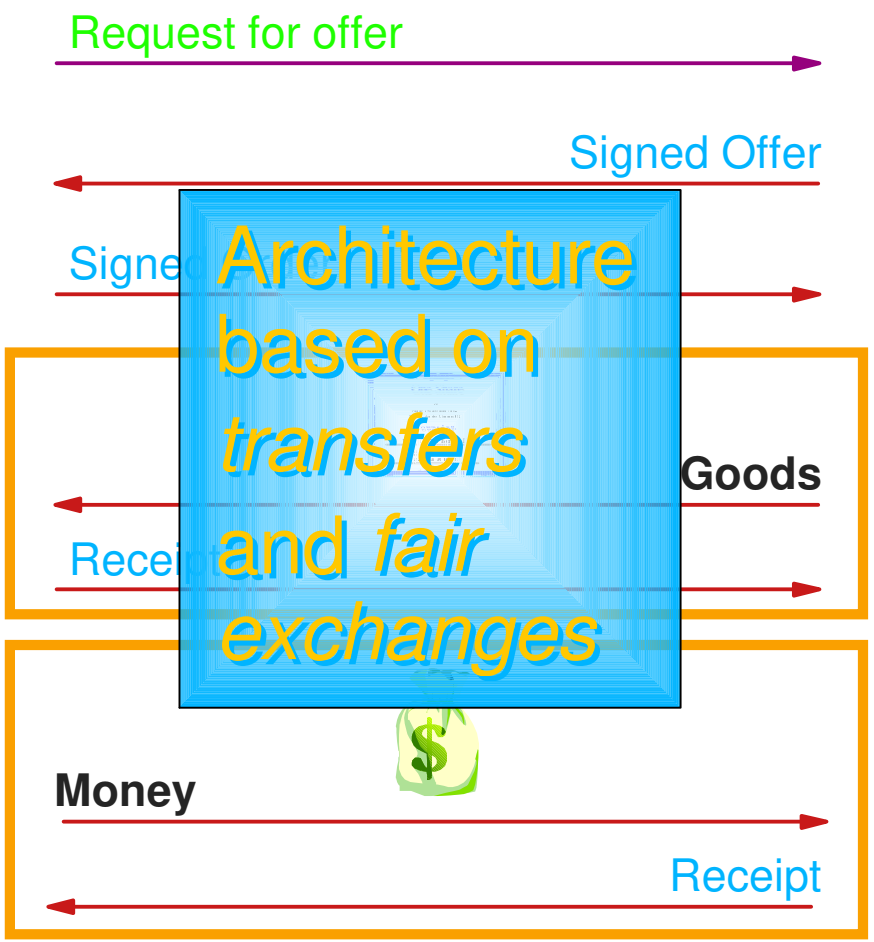

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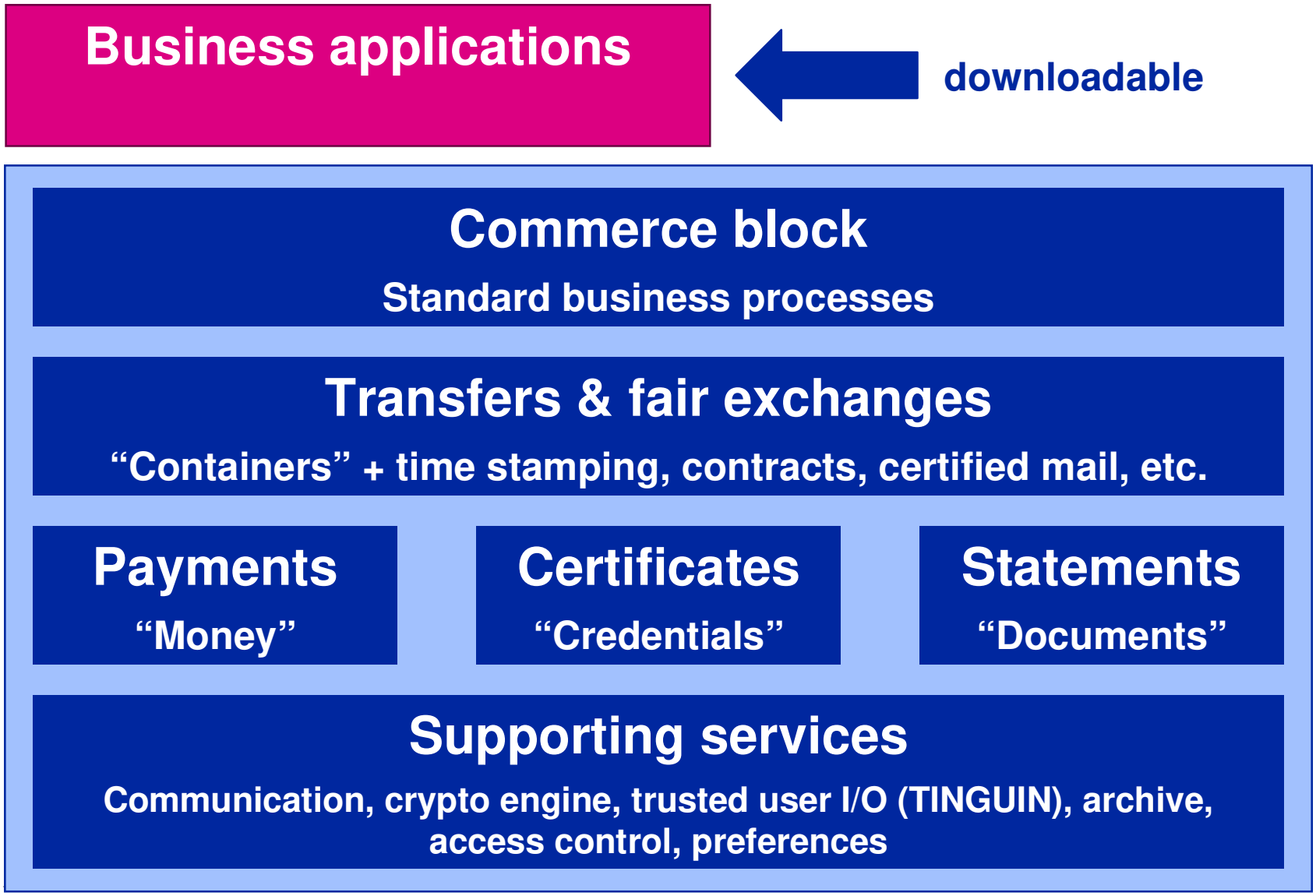
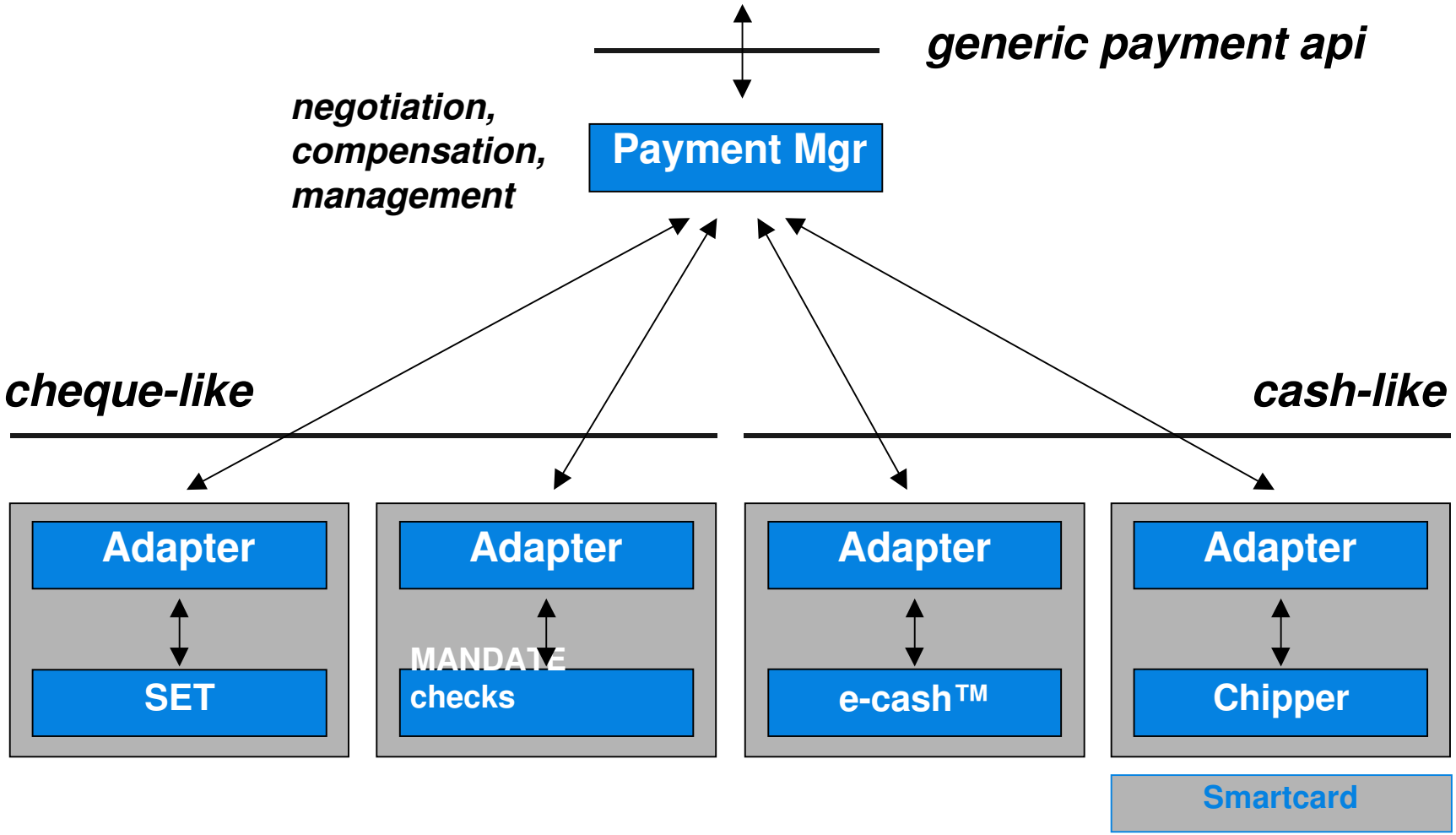
SEMPER architecture



Frameworks



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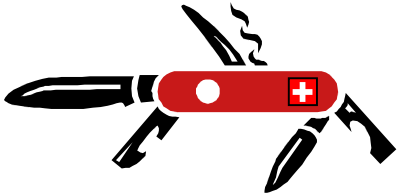

The Swiss Knife for Secure E-Commerce

- Framework for secure electronic commerce
  - coherent, comprehensive, extensible
- Principles
  - multi-party security
  - linking of secure steps into secure processes
  - document-level security
  - supports secure transfers and fair exchanges

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