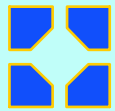
Electronic Commerce & Payments on the Internet



SEMPER

A security framework for electronic commerce

ACTS

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Agenda

1. Secure commerce
2. SEMPER project
3. Cross-border commerce

Friendly electronic commerce: a great challenge to security

- **Friendliness**
  - Ease of use
  - Ubiquitous software
  - Open access
- **Trust**
  - Identification of users
  - Negotiations
  - Reliability
- **Security**
  - Preserve transaction integrity
  - Ensure Privacy
  - Be legally predictable

Electronic commerce must be as friendly and secure as the traditional marketplace, or more!

Electronic commerce users need to become aware of threats

Threats against sellers

- No payment
- No legal status of orders
- No receipts of delivery
- Fake orders from fake customers
- Loss of reputation by fake servers
- Unauthorised data access
  - » keys
  - » dishonest competition
  - » confidential customer data

Threats against buyers

- order hijacking
  - » payment against nothing
  - » denial of service
- loss of privacy
  - » behaviour
  - » preferences
- unauthorised access
  - » keys
  - » credit information

Resolution of organizational issues is key to remove uncertainty

- **Issues**
  - High complexity of security technology
  - Trust
  - Interoperability
  - Legal uncertainty
  - Public key infrastructure
  - Cryptography
  - Training of users
- **Status**
  - Piecemeal progress
  - First good signs
    - » consensus on SET
    - » integration of Web sites with existing systems

It is becoming urgent to organize the electronic marketplace!

SEMPER: a systematic approach of the secure marketplace

- **Open security framework**
  - Model of the electronic marketplace
  - Open and generic security architecture
- **Security services**
  - Basic services
  - Advanced services
- **Validation**
  - Prototype
  - Field trials
- **Dissemination**
  - Requirements, guidelines
  - SEMPER specifications
  - Demonstrations

» G7
» standardisation committees
» scientific community
» public

SEMPER: a representative set of European experts

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.
- Hildesheim Univ.
- Saarbrücken Univ.

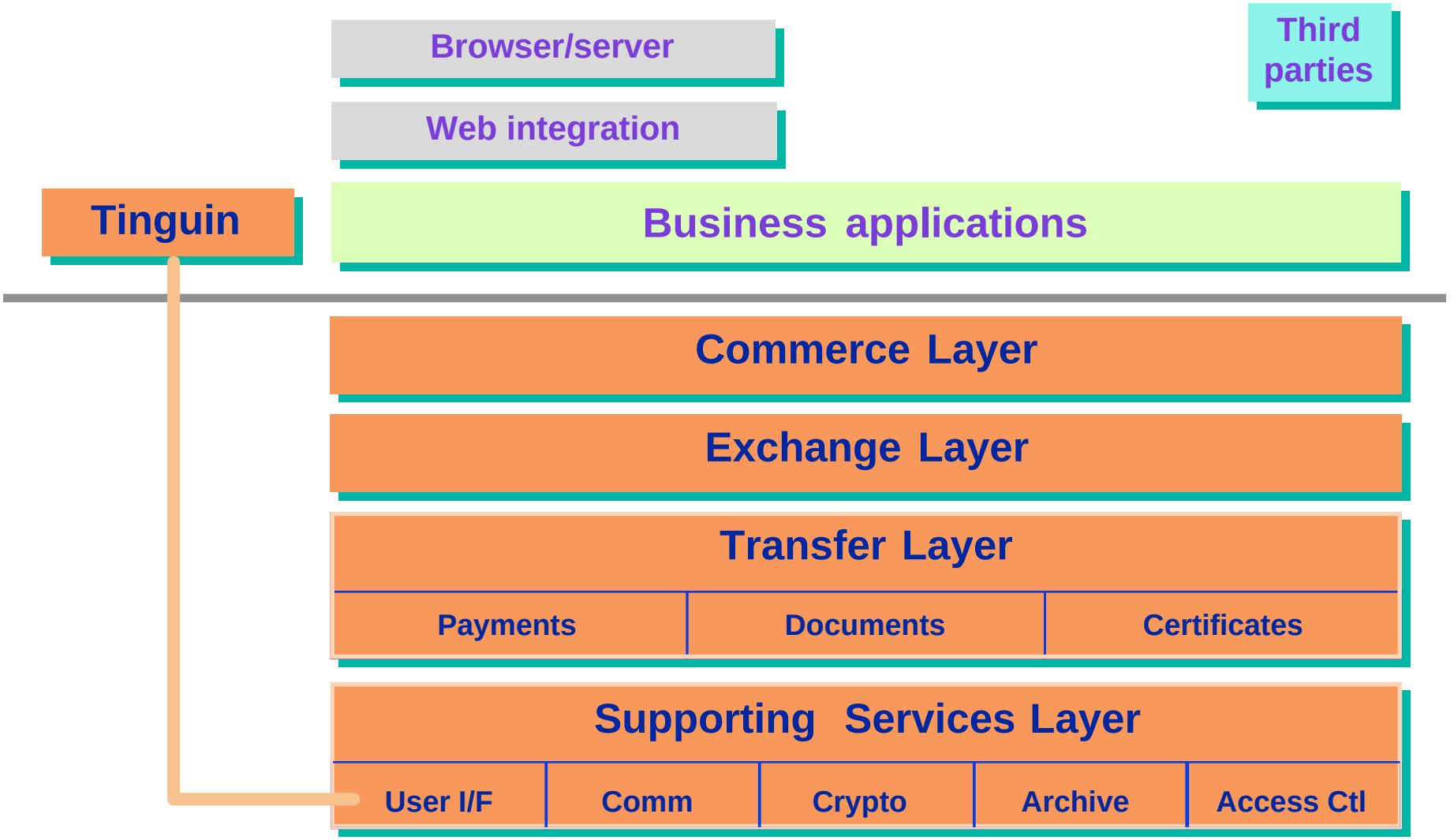
SEMPER shapes an open architecture for best acceptance

- **Model of the marketplace**
- **Open architecture**
- **Ubiquitous software**
- **System-level architecture**
- **Multi-party security**

SEMPER builds on fundamental standards

- **Portability** — **Java**
- **Communication** — **HTTP**
- **Payment** — **SET, Ecash, E-check**
- **Certification** — **X.509**
- **Cryptography** — **DES, RSA**
- **Transport** — **TCP/IP**

SEMPER proposes a layered security architecture



SEMPER makes users aware of critical information

Trusted user interface

Connected to ACTIMEDIA

Offer

BACH Preludes
BEETHOVEN Piano Sonatas

Price	750 FF
VAT tax	50 FF
Shipping	70 FF
TOTAL	870 FF

Signed May 25, 1997 14:00

ORDER SIGN PAY

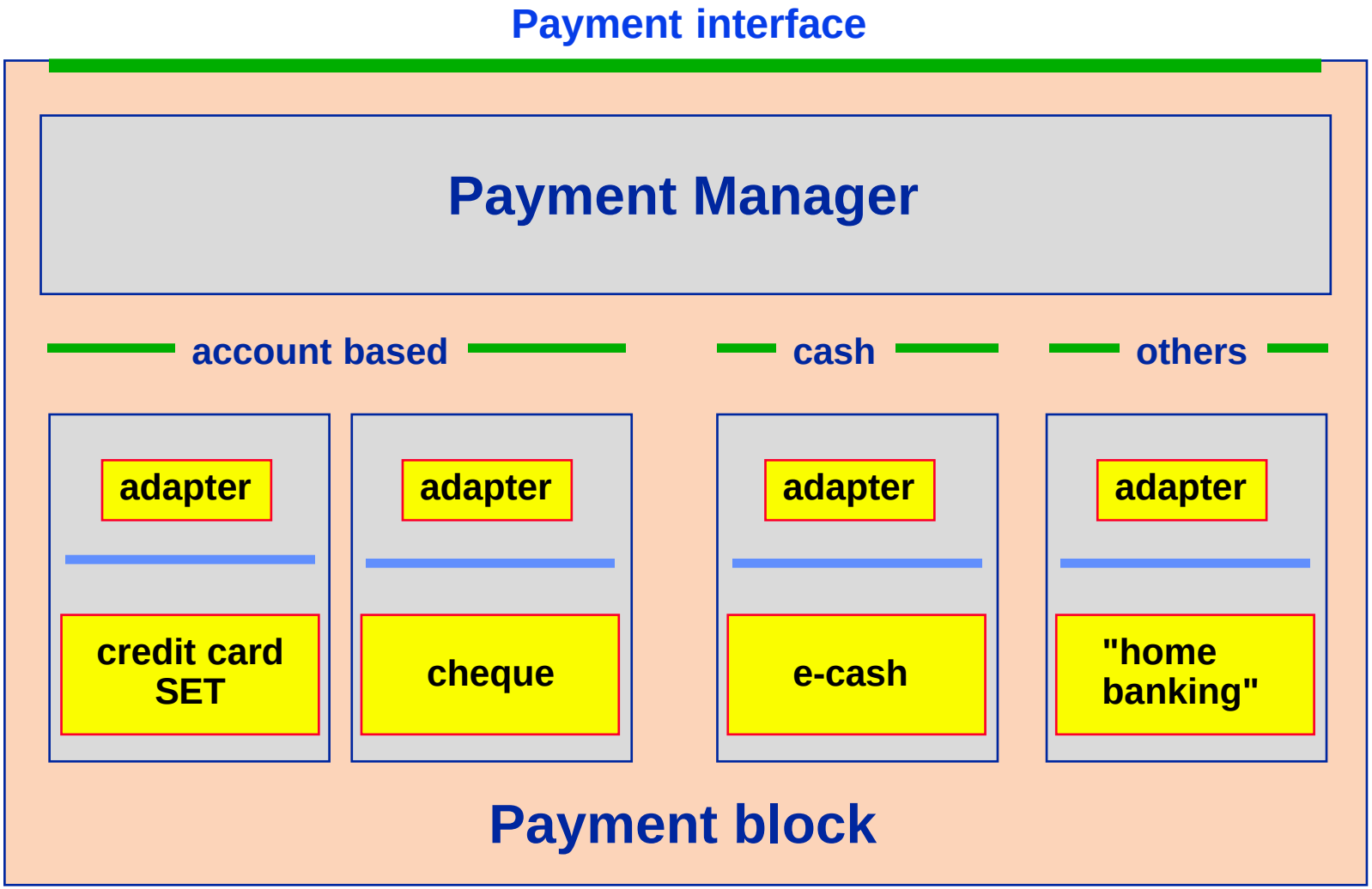
Browser window

Classical Music

☐	BACH Suites for violin	200 FF
☑	BACH Preludes	250 FF
☐	BACH Partitas	400 FF
☐	BEETHOVEN Trios	400 FF
☑	BEETHOVEN Piano Sonatas	500 FF
☐	BEETHOVEN Sonatas	700 FF
☐	COUPERIN	400 FF

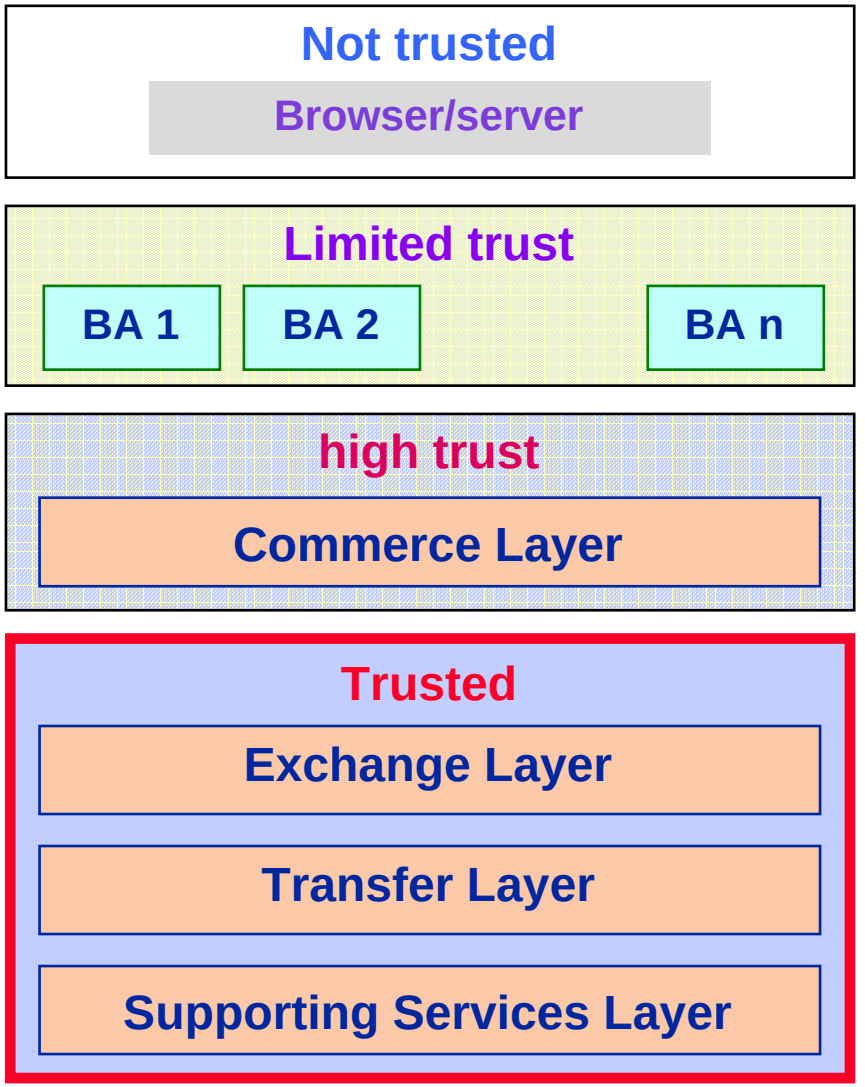
SEMPER openness: the payment block

431LG052



SEMPER architecture addresses multi-party security

- **Multi-party security**
  - Buyers
  - Service providers
  - Banks
  - RA/CA authorities
  - Notary public
  - Arbiters
- **Trust hierarchy**
  - Browser/server
  - Signed business applications
  - Commerce Layer
  - System kernel



BA Business Applications RA/CA Registration and Certification Authorities

SEMPER offers security services for today and for tomorrow

Basic services

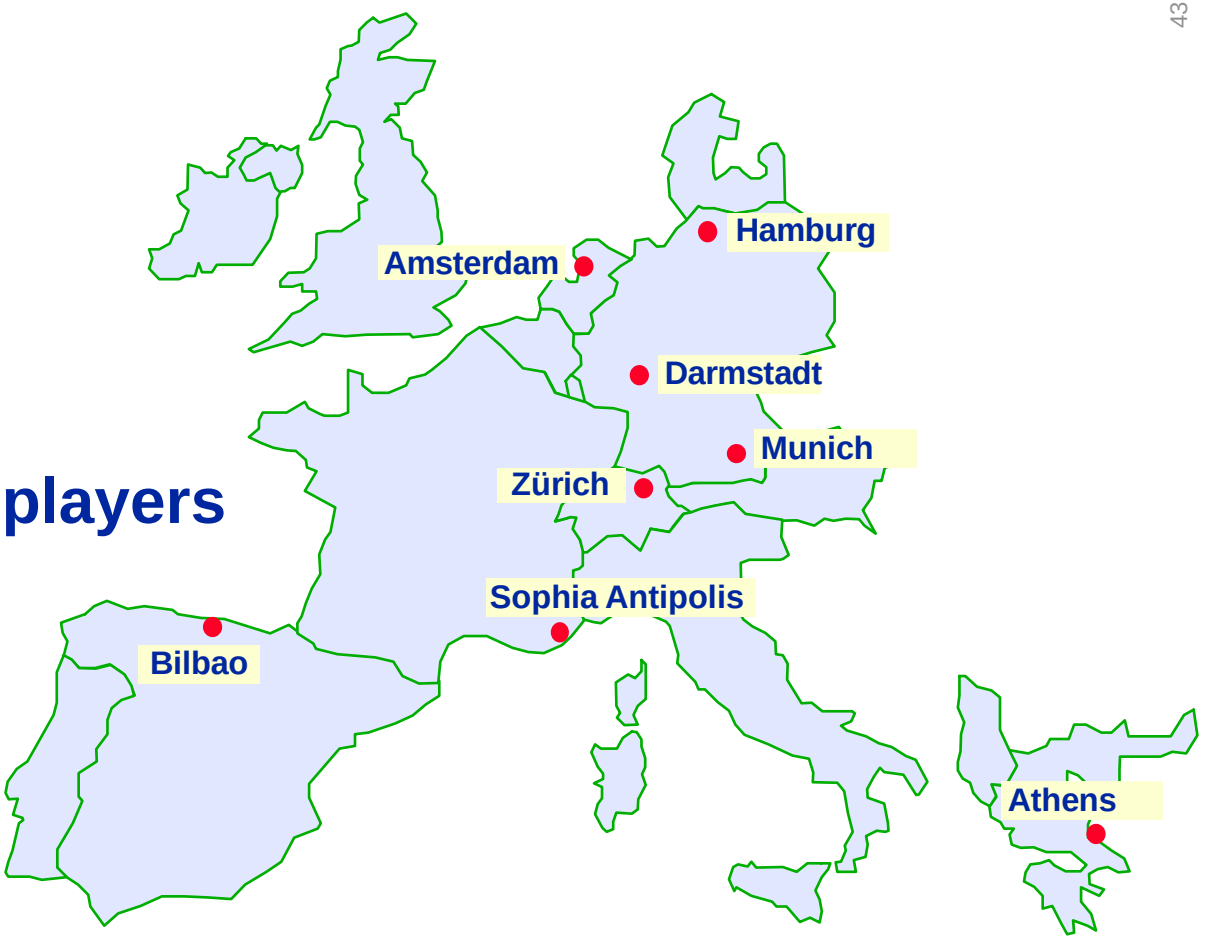
- Authentication
- Signed offer
- Signed order
- Payment
- Signed delivery

Advanced services

- Fair exchange
- Secure document handling
  - » Certified mail
  - » Contract signing
  - » Credentials
  - » ...
- New payment instruments
  - » Electronic cheques
  - » Stored-value cards
- Anonymity
- Resolution of disputes

SEMPER validation relies on a rich set of trials

- **Business contexts**
  - Distance learning
  - Mail order
  - Library
  - Travel
  - Image processing
  - Software localisation
- **Electronic commerce players**
  - Buyers
  - Sellers
  - Banks
  - RA/CA authority
- **Payments**
  - SET
  - Ecash
  - Chipper



SEMPER collects useful indicators from initial experiments

- **Basis**
  - Sites opened and in preparation
  - Basic services only
- **Results**
  - Buyers
    - » Trusted user interface provides much comfort, needs to be more friendly
    - » Education and training is a strong requirement
  - Sellers
    - » Concerned mainly by payment issues
    - » Underestimation of integration efforts
  - Banks
    - » Integration of electronic payment instruments raises difficulties
    - » Cross-border electronic commerce poses legal issues
  - Technology
    - » No architectural problem for trials implementation
    - » Access to more accurate requirements on Commerce Layer and Trusted user interface

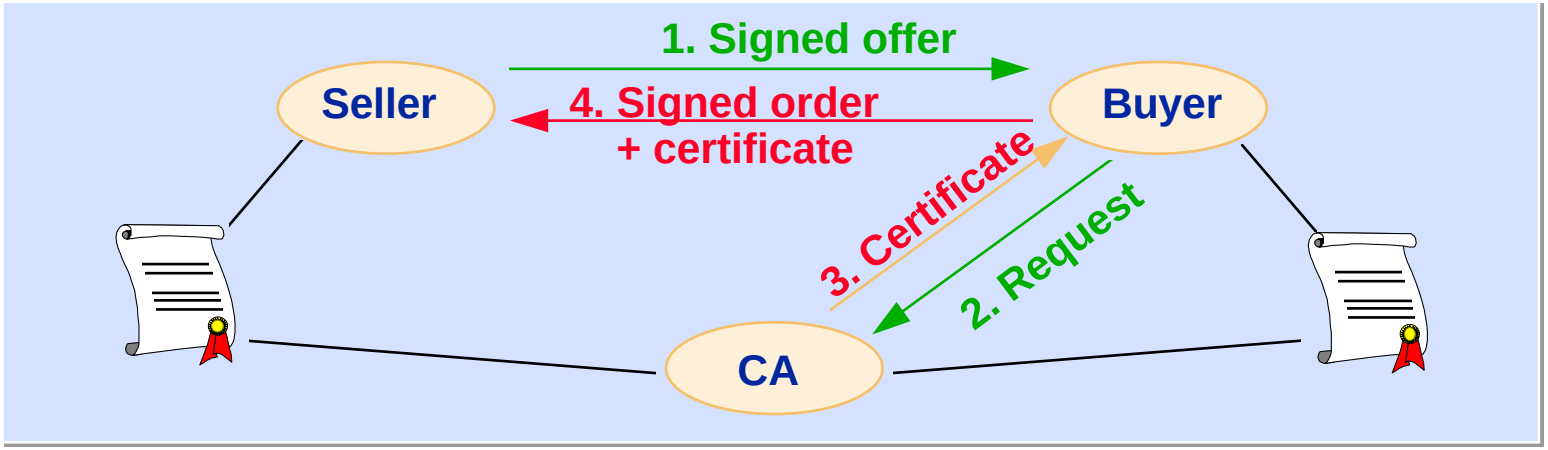
Users uncertainty grows with international electronic commerce

- **Patchwork of laws across countries**
  - Users are not trading experts
  - Different, contradicting, laws
    - Advertising
    - Sales practices
    - Intellectual property rights protection
    - Privacy
  - Legal jurisdictions
    - Applicable law may be selected by the parties
    - Buyers cannot be deprived from their home country protection
    - Jurisdictions of convience may appear
- **Unclear legal status of technology**
  - Cryptography
  - Digital signatures
  - Electronic records

Routine international electronic commerce requires a well-defined legal framework

SEMPER agreements reduce uncertainty

- **Model**
  - Third party (CA) agreements signed on paper by sellers and buyers
  - Agreement limits buyers' liability
  - CA's certificates ensure buyers' liability



- **Benefits**
  - Buyers are protected against potentially high loss
  - Sellers can safely enlarge their market share

A step towards a well-defined legal situation for routine international electronic commerce

SEMPER is leading the way to the secure marketplace

The global secure electronic marketplace requires

a security framework

NOW

SEMPER

is making global secure electronic commerce

POSSIBLE

http://www.semper.org