PRIME

Privacy and Identity Management for Everyone/Europe

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with a PRIME hat on

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Privacy and Identity Management for Europe

- The PRIME project receives research funding from the Community's Sixth Framework Programme and the Swiss Federal Office for Education and Science.
- Integrated Project in the Information Society Technologies Priority
- Duration: 4 years (March 2004 – February 2008)
- Budget: M€ 18 (M€ 10 granted EC contribution, M€ 1 Swiss contr.)
- Number of Partners: 20
- Reference Group

PRIME Partners: Industry & Academia

IBM Belgium, B

IBM Zürich Research Lab, CH

Unabhängiges Landeszentrum für Datenschutz, D

Technische Universität Dresden, D

Katholieke Universiteit Leuven, B

Universiteit van Tilburg, NL

Hewlett-Packard, UK

Karlstads Universitet, S

JRC / IPSC Ispra, I

Università di Milano, I

Centre National de la Recherche Scientifique / LAAS, F

Johann Wolfgang Goethe-Universität Frankfurt am Main, D

Chaum LLC, USA

RWTH Aachen, D

Institut EURECOM, F

Erasmus Universiteit Rotterdam, NL

Fondazione Centro San Raffaele del Monte Tabor, I

Deutsche Lufthansa, D

Swisscom, CH

T-Mobile, D

PRIME Goals

Identity, Privacy, and Trust Management

Vision: *In the Information Society, users can act and interact in a safe and secure way while retaining control of their private sphere.*

Goal: Empower the user to manage and protect her private data effectively.

PRIME's Objectives

- Advance the state-of-the-art in privacy-enhancing identity management
- Demonstrate how to embed (European) privacy laws and regulations into technology
- Empower individuals to effectively realise their right to privacy and informational self-determination

→ Development of real-world tools and solutions for identity management

- Legal, Social, Economic Framework
- Architecture and middleware prototype incl. Identity Mixer

→ Demonstrator for 3 real-world applications

- eLearning (Anonymous Learning, Roles, Certificates)
- Location based Services (Policies)
- Airport Security Controls (Data Minimization)

PRIME Approach

Privacy Enhancing IDM Design Principles I

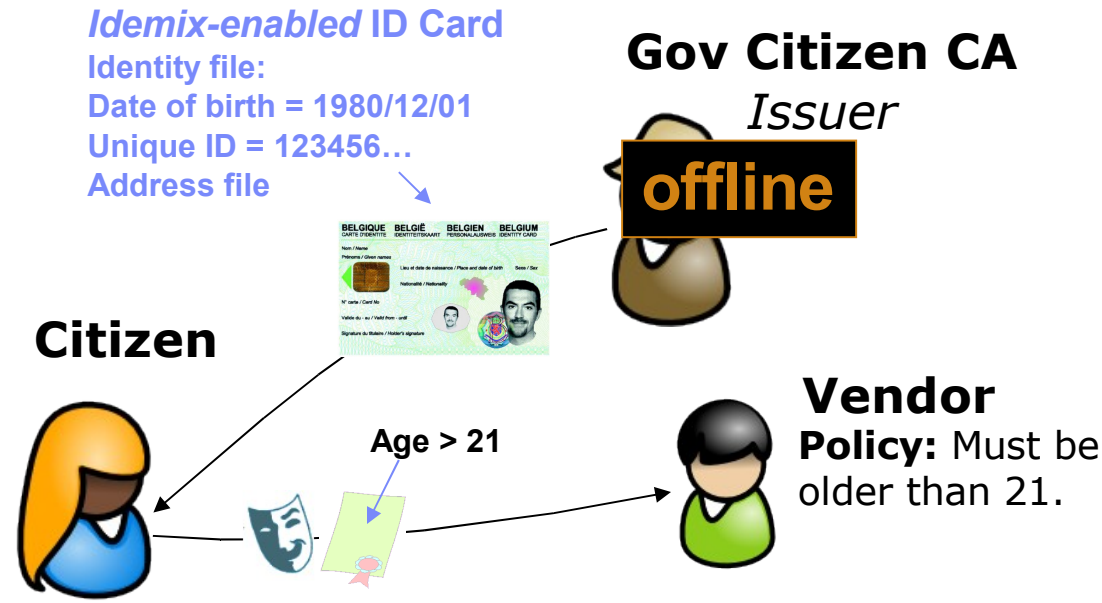
- Privacy needs an Integrated Approach
  - Legal, social, economic requirements
  - Roles and responsibility of different stakeholders
    - Individuals (users, data subjects)
    - User & Consumer associations
    - Policy Makers, Parlamentarians
    - Privacy Commissioners
    - Research Communities
    - Data processors
    - Service providers, Operators
    - Standardisation Organisations
    - System developers and designers
    - Business and industry organisations, Trade Unions
    - Law enforcement organisations
    - Media

Privacy Enhancing IDM Design Principles II

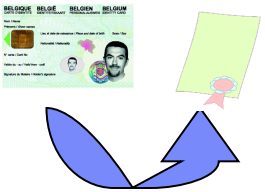
- Design must start from maximum privacy
  - Anonymous & secure communication
  - No transaction linking by default
  - Privacy friendly business processes
  - Sometimes special crypto application (voting, etc)
- Explicit privacy rules govern system usage
  - Explicitly set the rules
  - Explicitly set the per role settings
- Privacy rules must be enforced, not just stated
- Privacy enforcement must be trustworthy
- Privacy must be usable
  - Users need tool support for IDM
  - Tools must be *easy to use* (good HCI)

PRIME Solution: Identity Mixer

Identity Mixer: Superior Privacy Protection…



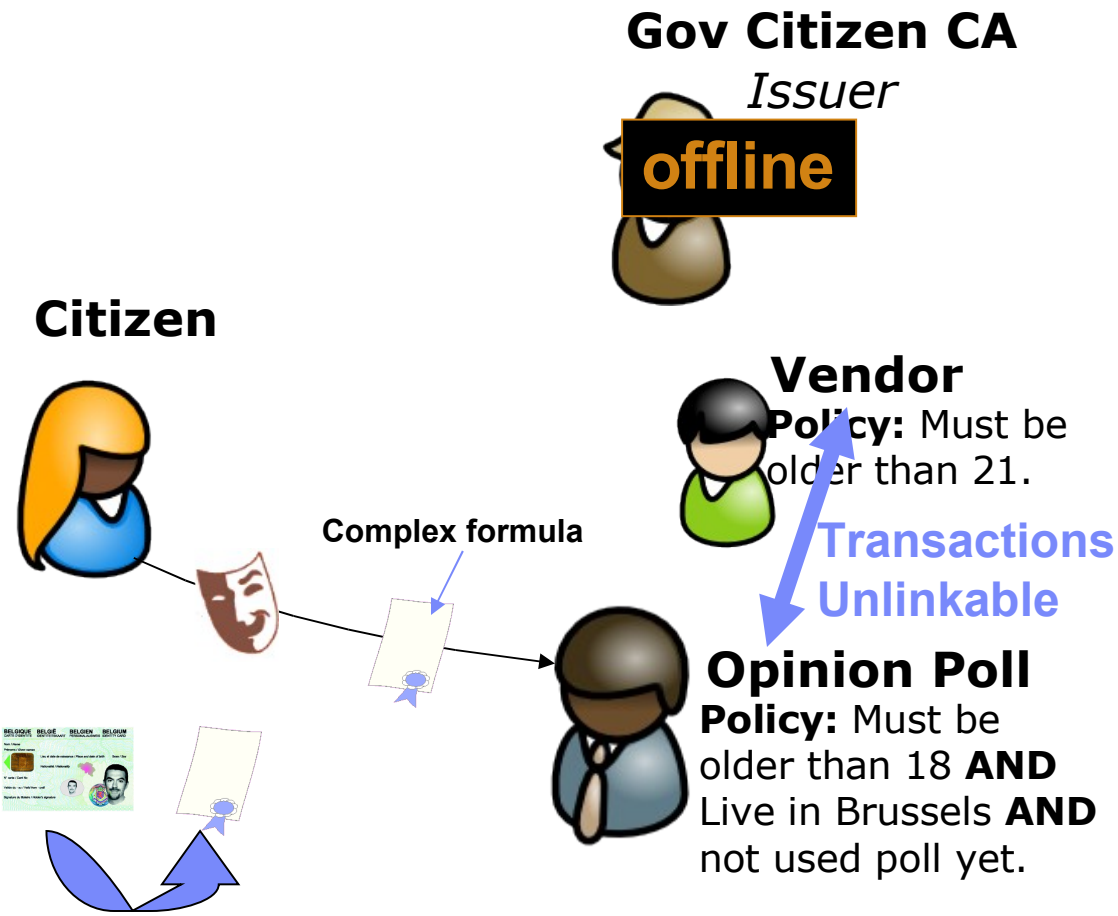
- Citizen holds ID Card with *idemix* private certificates.
- Vendor may have simple policies "age > 21"…
- ID Card generates *new* token from the original private certificate.
- Proves "age > 21 according to ID Card" ...



Proof:
"My ID Card states:
I'm older than 21."

Important: new token valid under public key of the Gov Citizen CA!

Identity Mixer: Strong Privacy Protection…

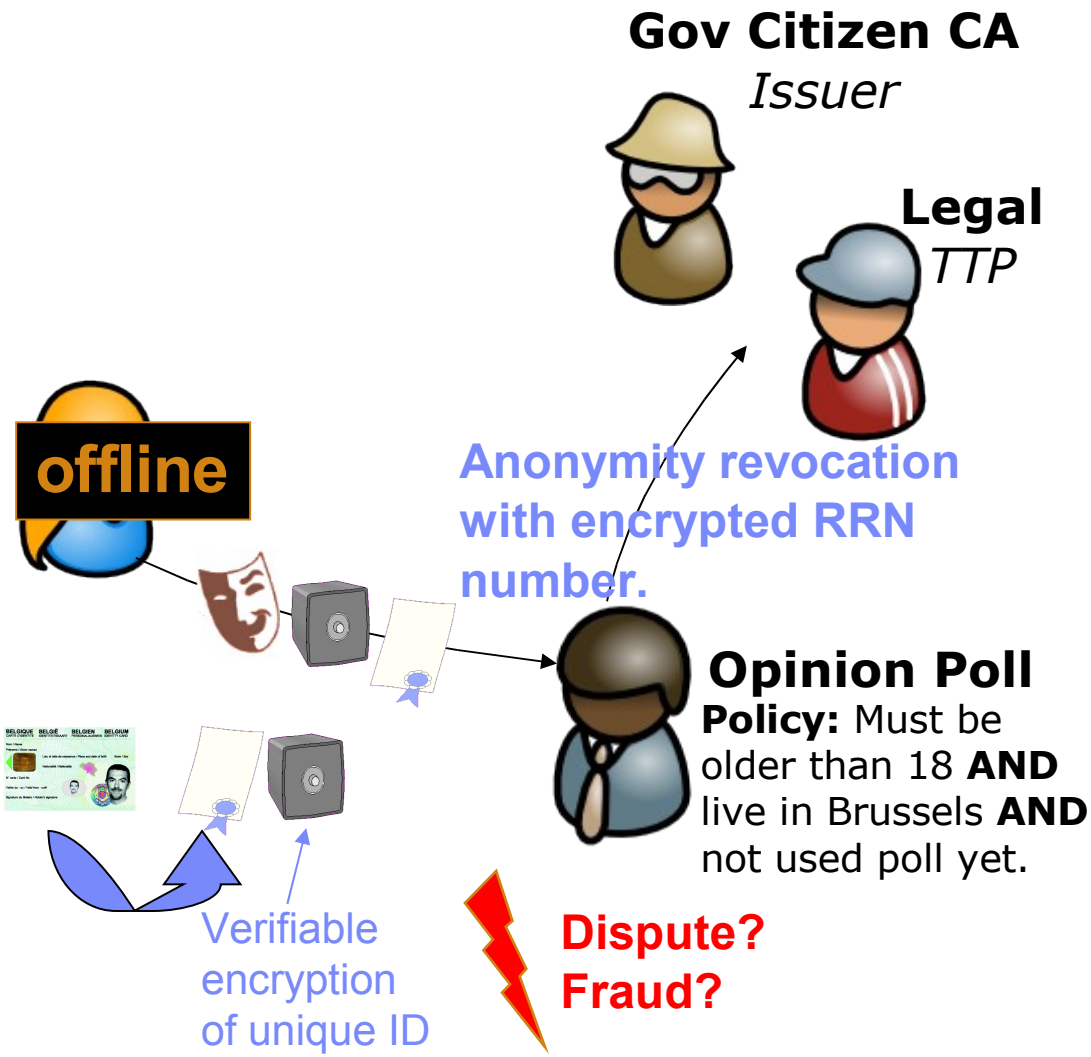


- Citizen holds ID Card with *idemix* private certificates.
- Vendor may have simple policies "age > 21" or complex formulas (opinion poll)
- ID Card generates *new* token from the original private certificate.
- Proves complete logical formula over arbitrary attributes.

Important: Unlinkability implies strong privacy protection for honest citizens!

Proof:
"My ID Card states:
I'm older than 18 **AND** live in Brussels **AND** I have not attended this poll yet."

Identity Mixer: … AND Strong Security

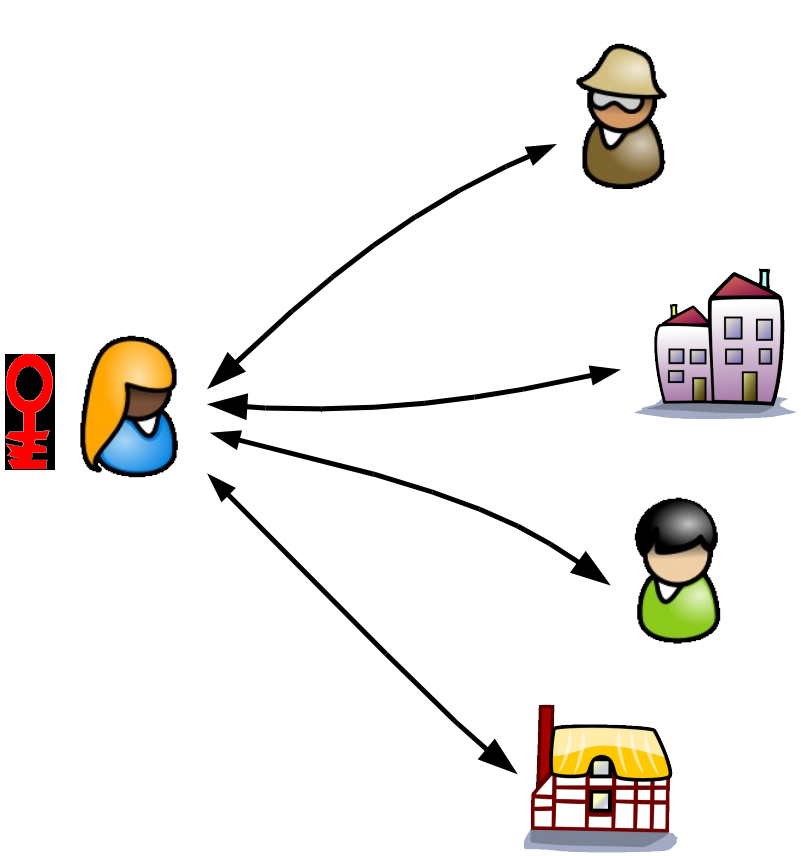


- Citizen may be offline after transaction.
- In case of disputes or fraud, anonymity of perpetrators can be easily revoked by authorities.
- Proof token contains unique ID (e.g., SSN number, strongly encrypted):
  only readable by authorities.

Important: honest citizens stay anonymous whereas fraudulent individuals are easily caught.

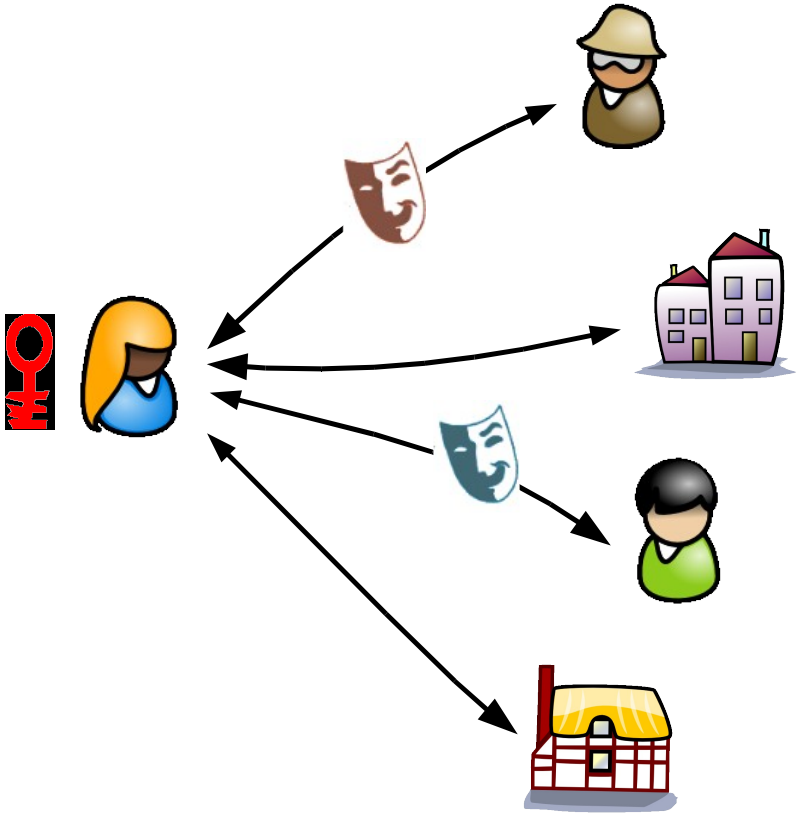
Partial Identities with Identity Mixer

- Single Secret Key



Partial Identities with Identity Mixer

- Single Secret Key
- Different IDs/Pseudonyms



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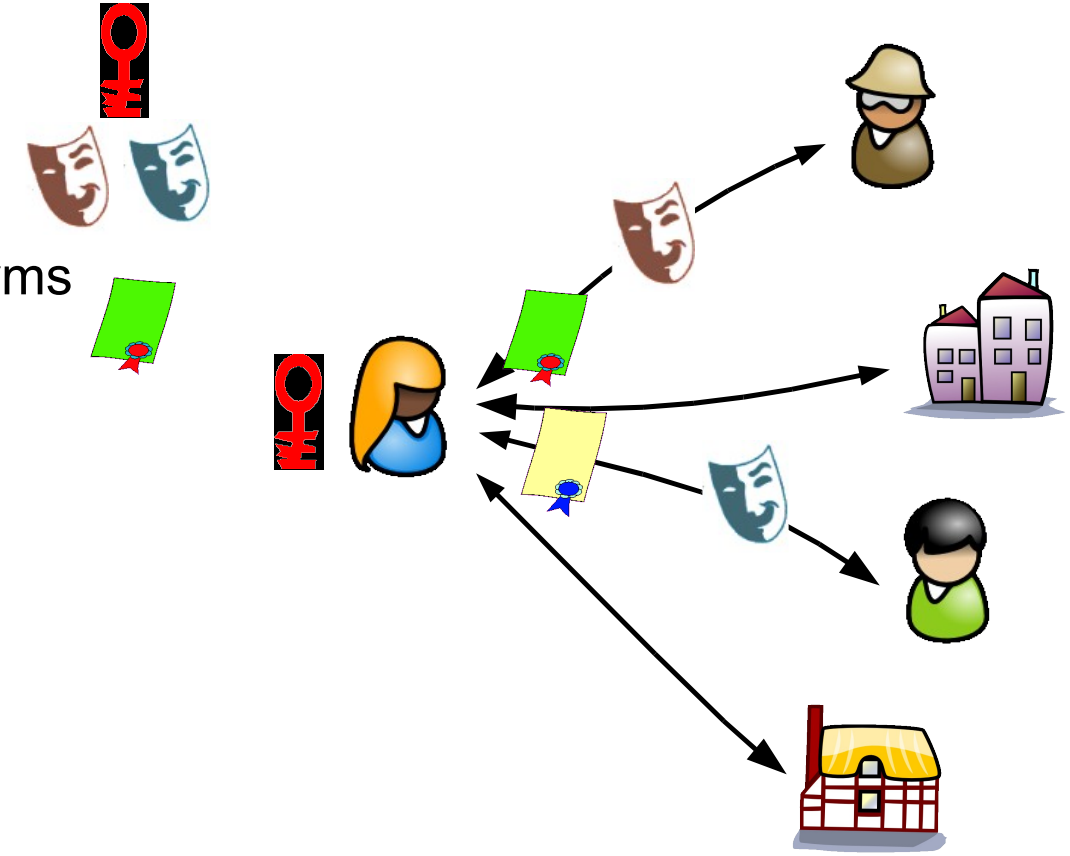
Partial Identities with Identity Mixer

- Single Secret Key
- Different IDs/Pseudonyms
- Credentials on different nyms (e.g., identity on ID Card)



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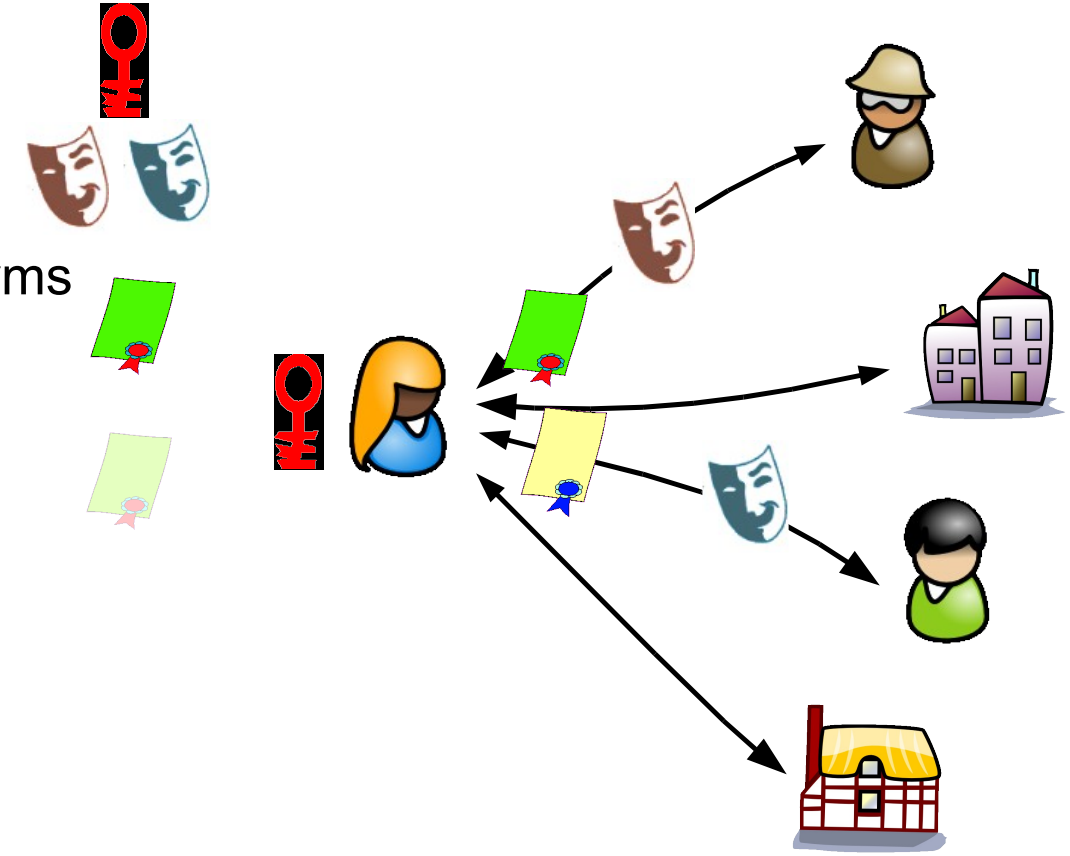
Partial Identities with Identity Mixer

- Single Secret Key
- Different IDs/Pseudonyms
- Credentials on different nyms (e.g., identity on ID Card)
- Controlled Release of Attributes (e.g., age>21)
- Enable Accountability & Anonymity



Conclusions

- Identity management with strong privacy protection is emerging significantly.
- Open standards are vital for enabling collaboration between all stakeholders and organizations.
- Do promote pseudonyms, partial identities, and controlled attribute release.
- When in doubt, empower the user!

Contact Information

Public Web Site

- www.prime-project.eu

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