eduroam:

towards a pan-European research and education federation

CUC 2005, Dubrovnik
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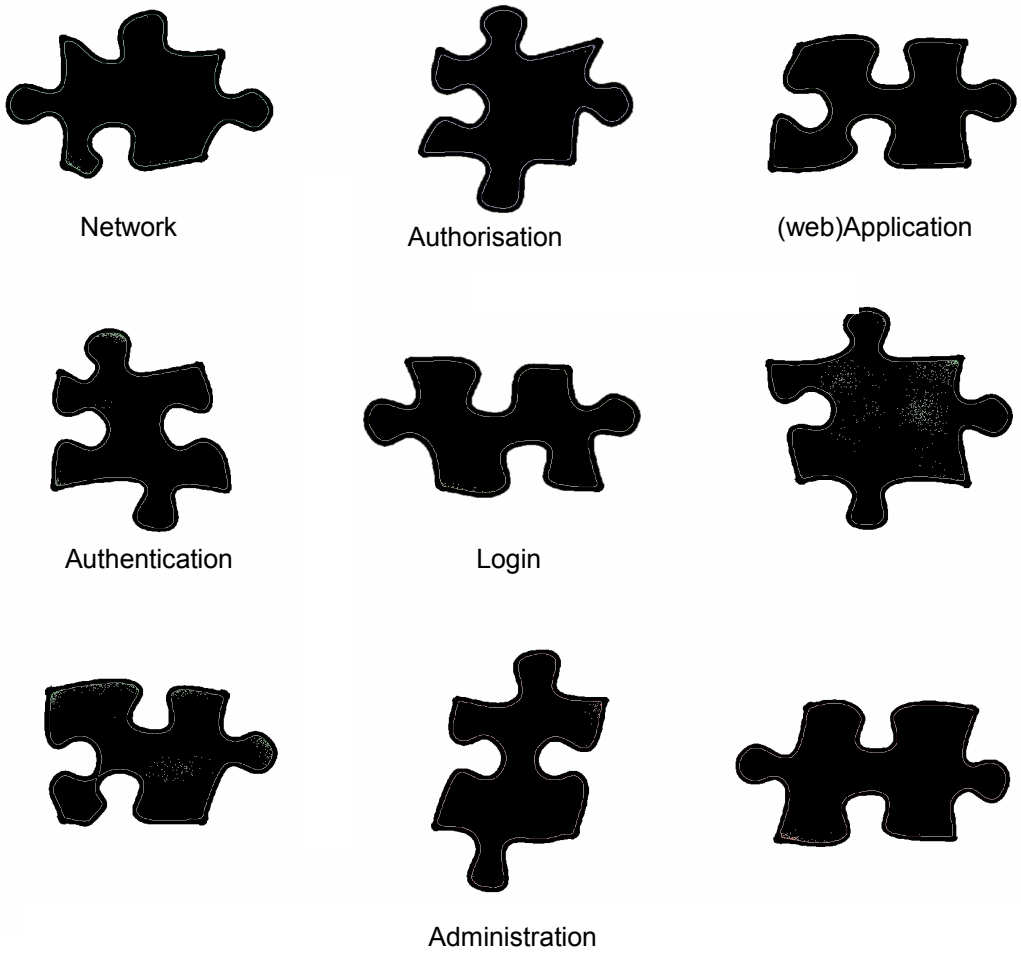
Contents

- Introduction to federations
- Federations for education
- Network access: *eduroam*
- Application access
- Conclusions

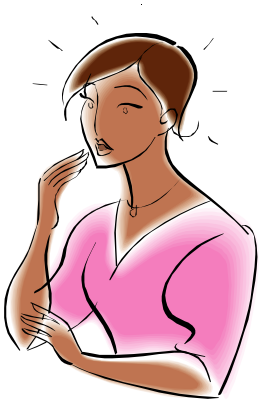
Ingredients of an AAI (CUC 2004)

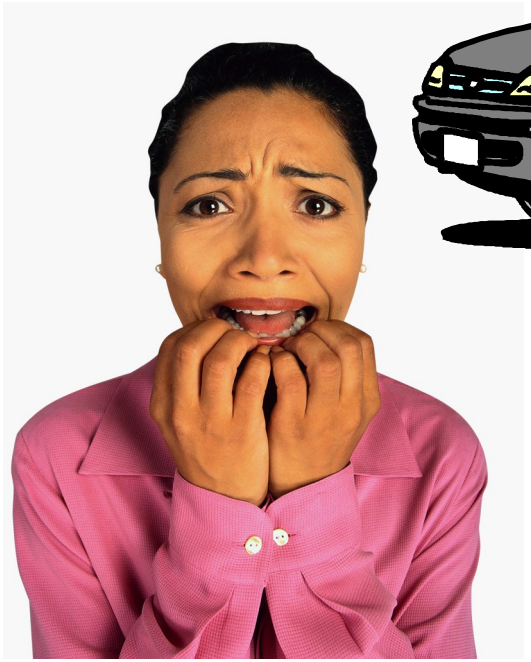


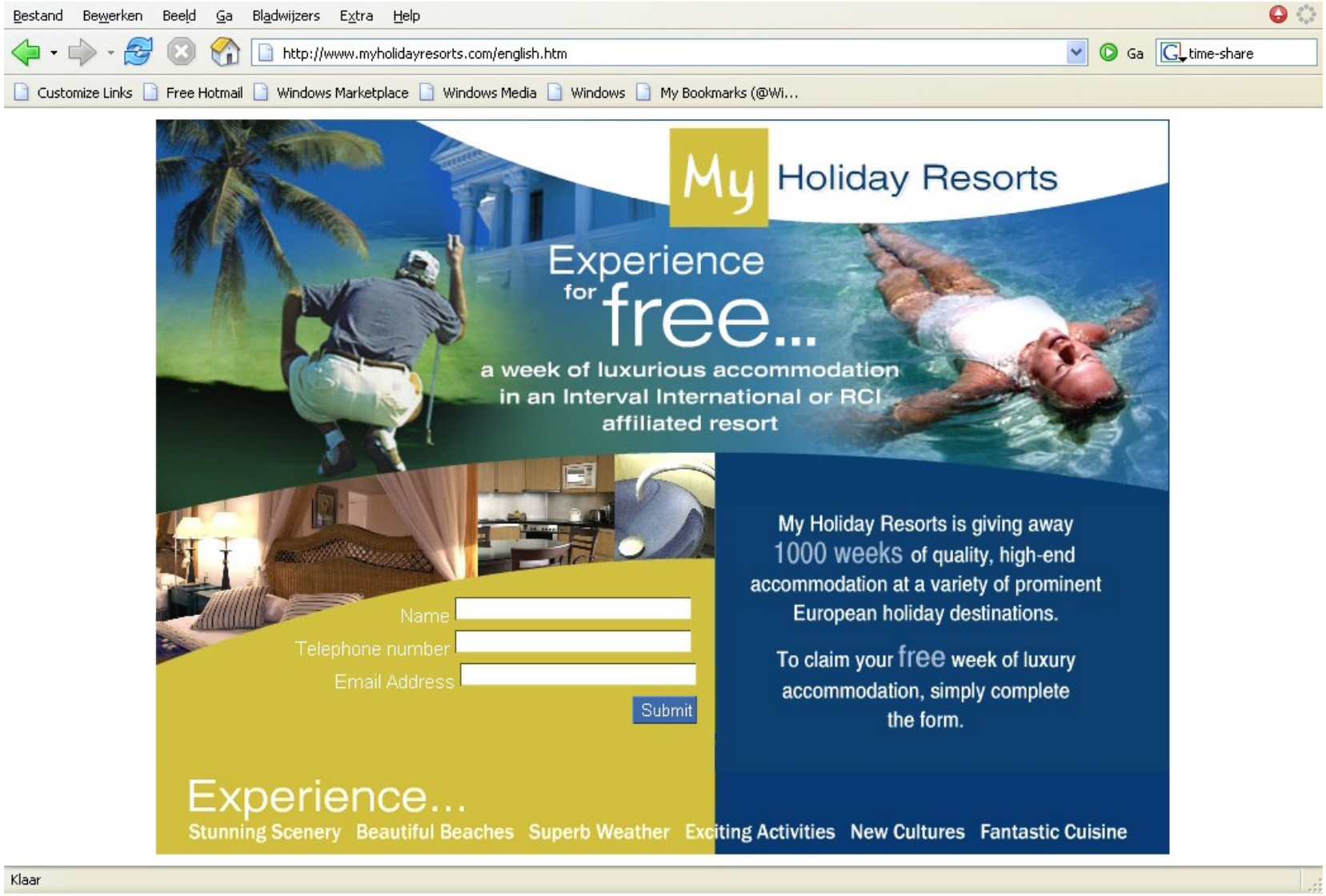
SURFnet

Buzzword of the day:

Federations



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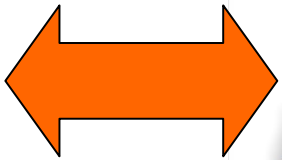
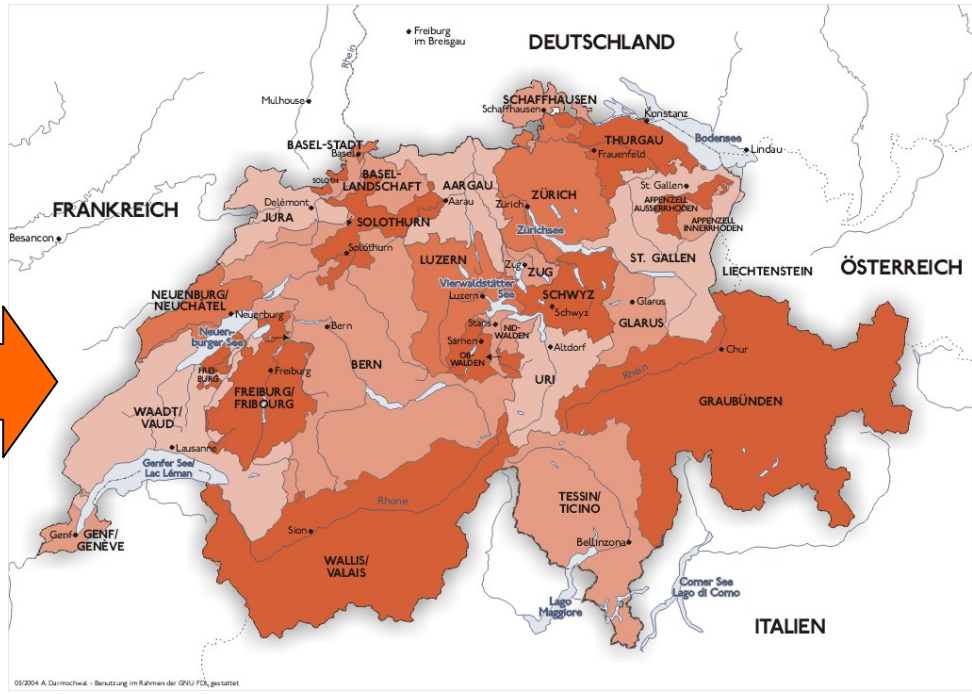
H
B
Basse Saxe Niedersachsen
Brandebourg
Saxe Sachsen
Berlin
Brandenburg
Anhalt
Westphalie Westfalen
Rhénanie du nord Nordrhein
Thuringe Thüringen
Saxe Sachsen
Hesse Hessen
Rhénanie Rheinland
Franconie Franken
Sarre Saarland
Palatinat Pfalz
Bade Wurtemberg Baden Württemberg
Souabe Schwaben
Bavière Bayern
100 km

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ÖSTERREICH
ITALIEN
Freiburg im Breisgau
Mulhouse
Rhein
SCHAFFHAUSEN
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Konstanz
Bodensee
Lindau
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Basel
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Besançon
Solothurn
LUZERN
ZUG
ST. GALLEN
LIECHTENSTEIN
Vierwaldstätter See
Luzern
SCHWYZ
Schwyz
Glarus
NEUENBURG/ NEUCHÂTEL
Neuenburg
Bern
Neuenburger See
Stans
NID-WALDEN
GLARUS
Sarnen
OB-WALDEN
Altdorf
Chur
FRIBOURG
Freiburg
BERN
URI
FREIBURG/ FRIBOURG
GRAUBÜNDEN
WAADT/ VAUD
Lausanne
Genfer See Lac Léman
Rhone
TESSIN/ TICINO
Genf
GENF/ GENÈVE
Sion
Bellinzona
WALLIS/ VALAIS
Lago Maggiore
Comer See Lago di Como

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Federations

- Federations enable the sharing of resources
- A federation is constituted by a set of agreements between peers
- In a federation agreement there needs to be a common language
- Federations can be part of bigger federations
- Federations can cooperate with other federations: confederations

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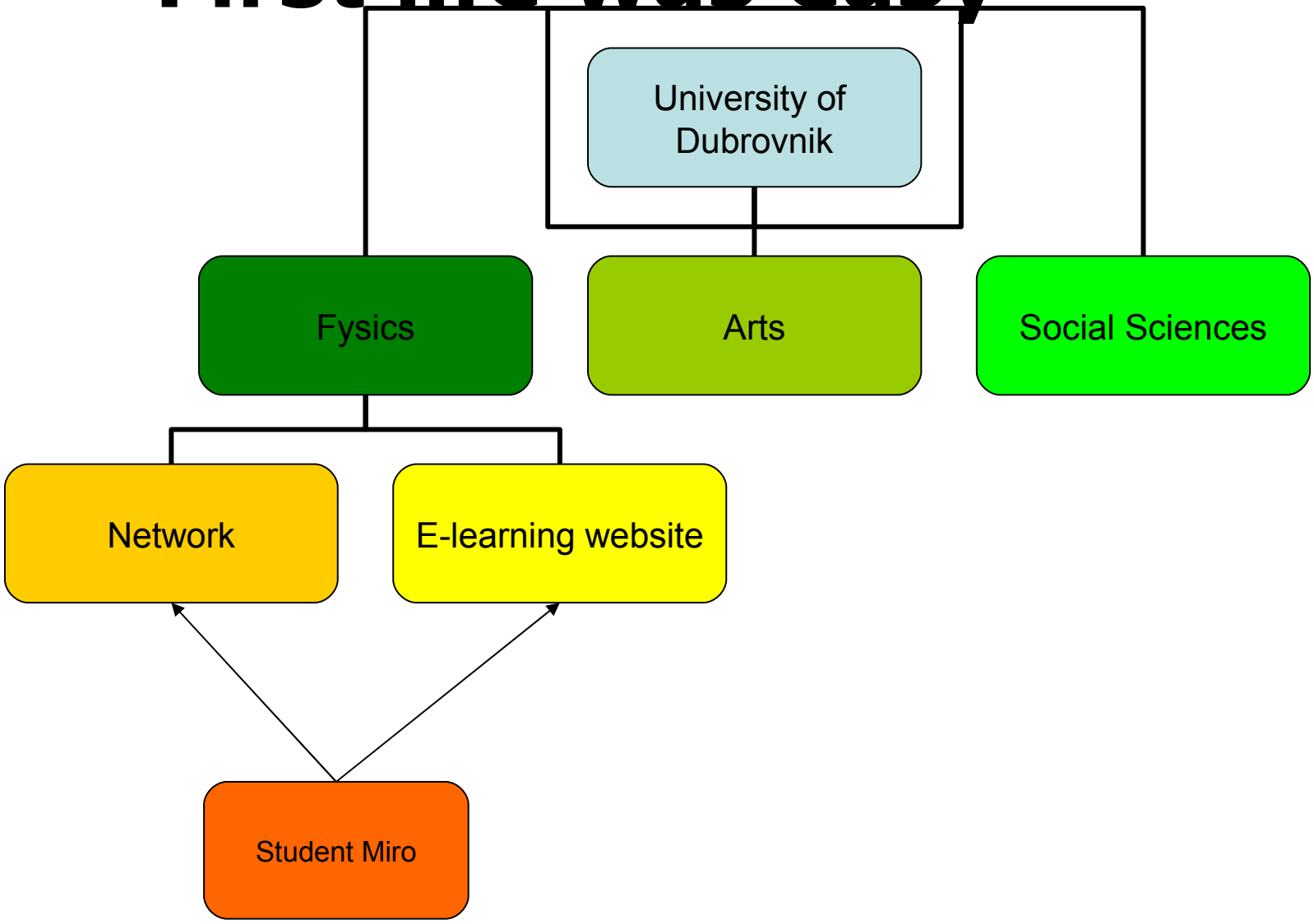
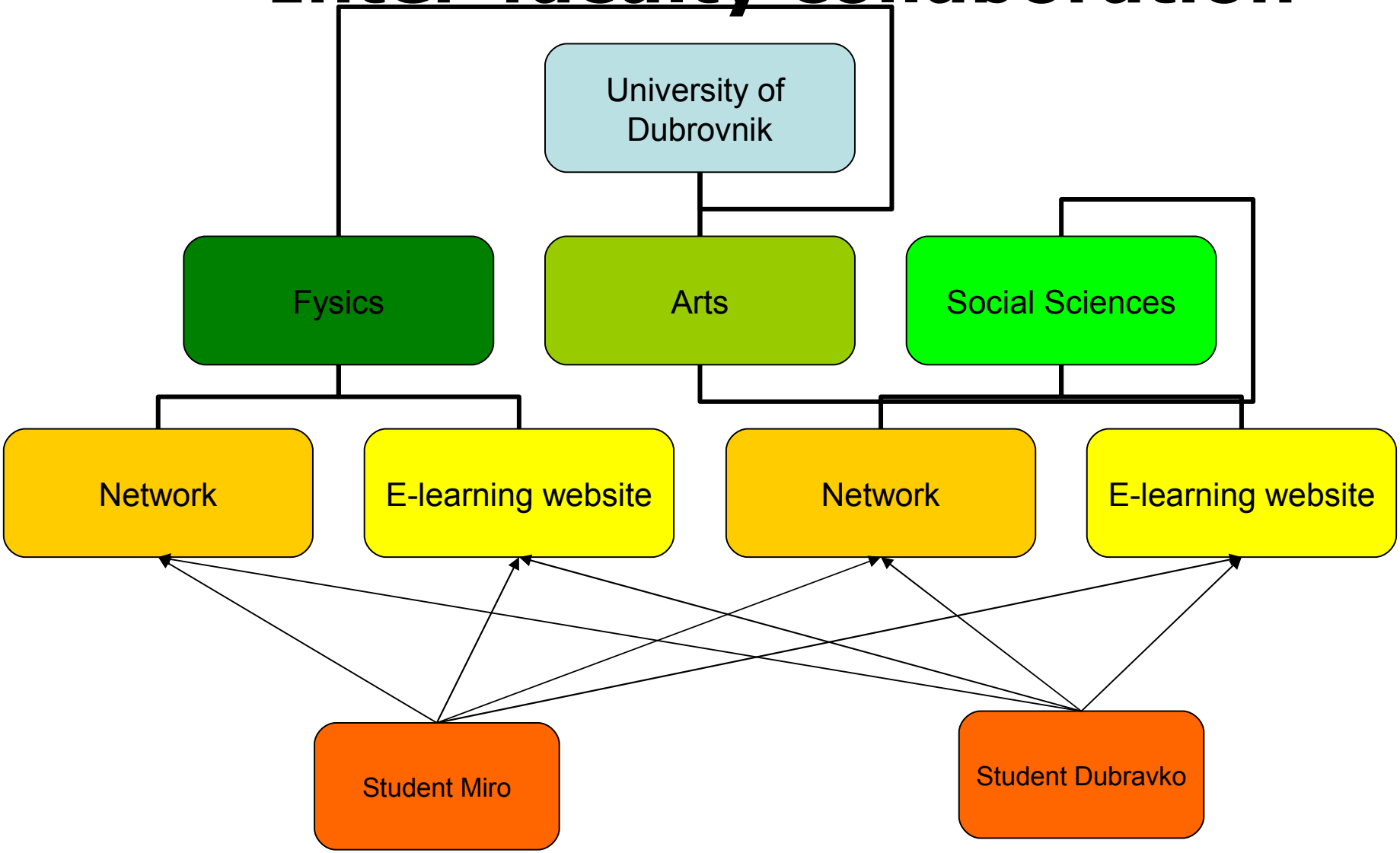
Federations for education

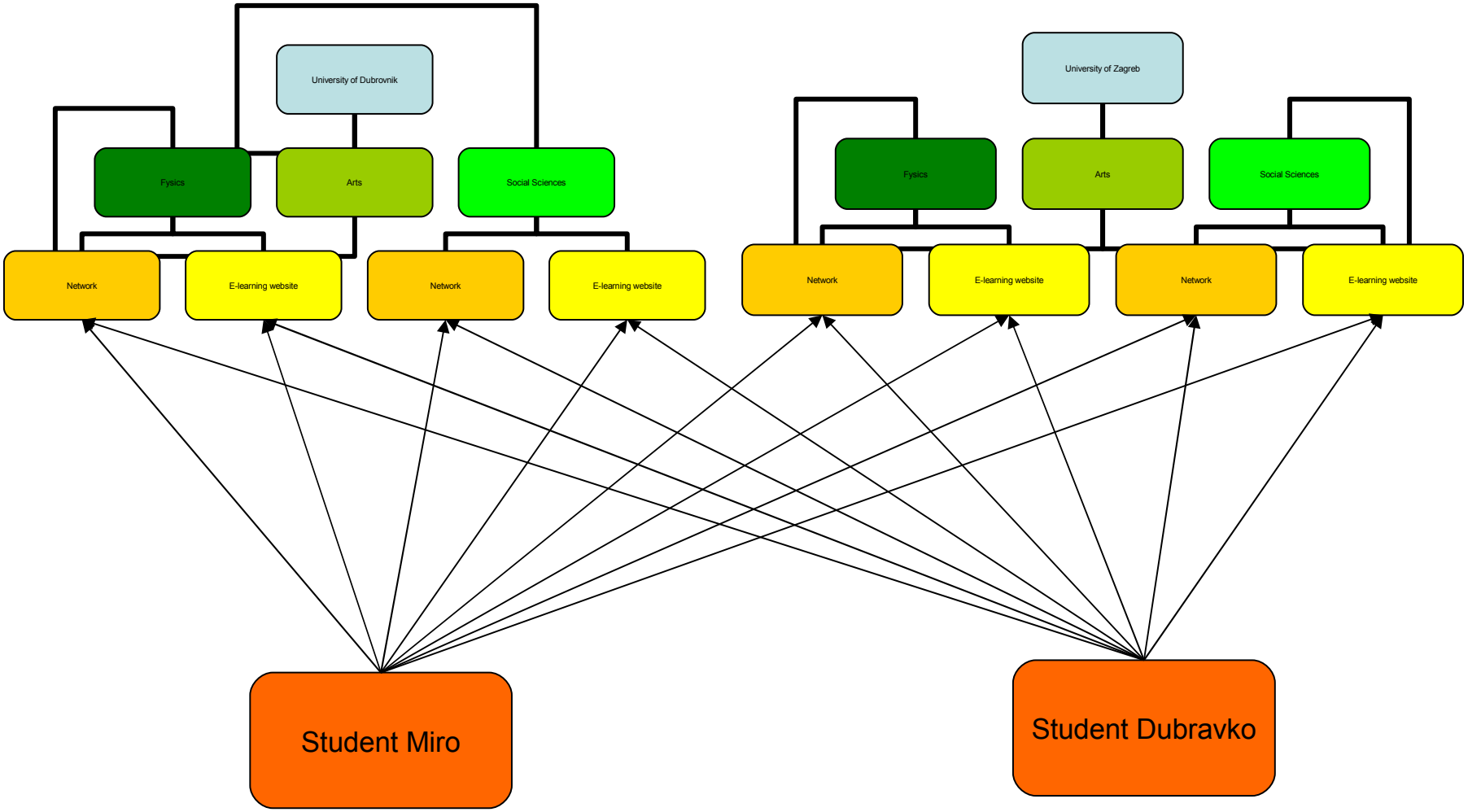
First life was easy



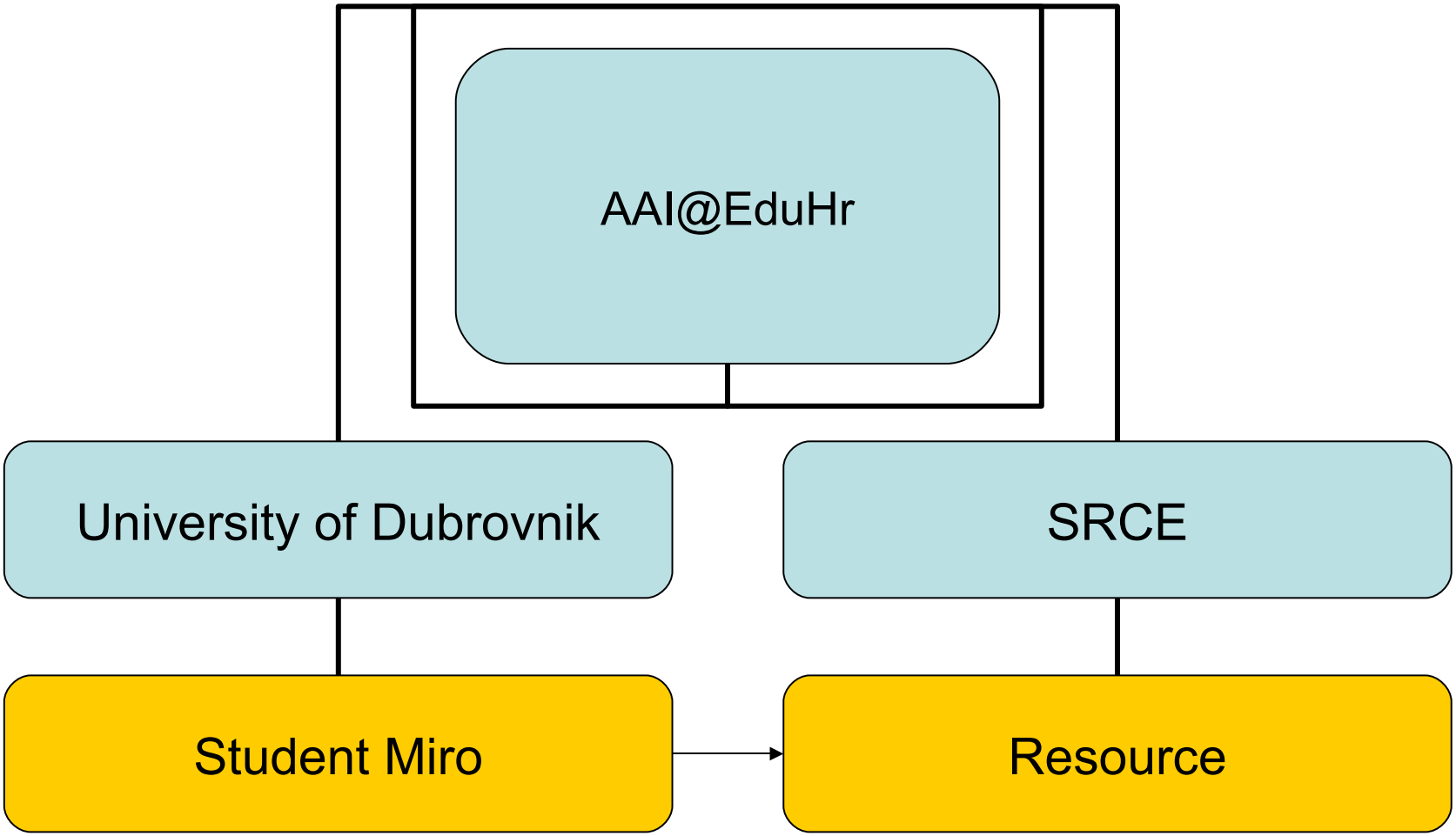
Inter-faculty collaboration



Inter-institution collaboration



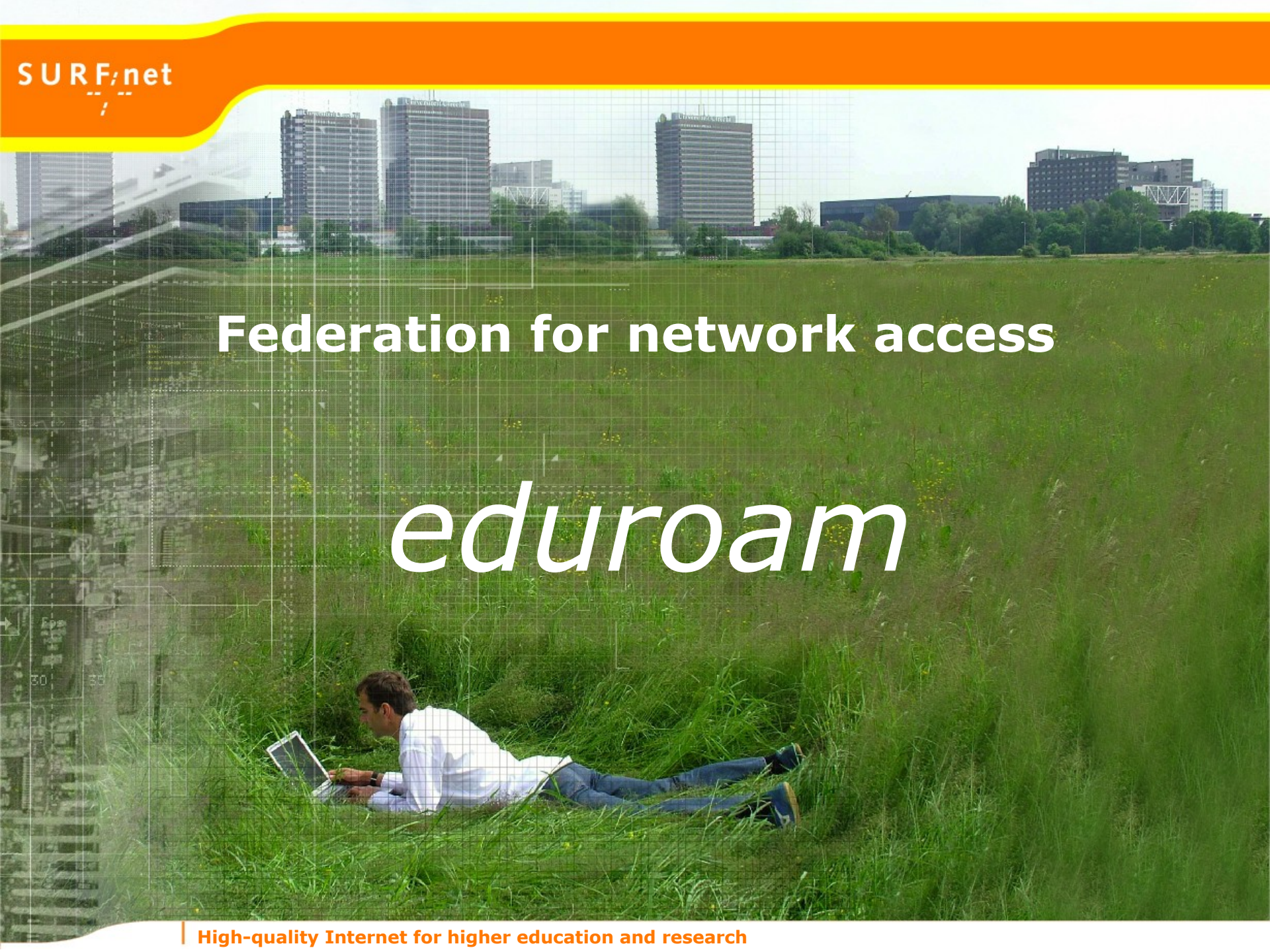
Life becomes easy again



Federations for education

- Enable the sharing of educational resources
  - Network
  - Applications
    - Online learning systems

- Require agreement on:
  - Responsibilities
  - Liability
  - Technology
  - Language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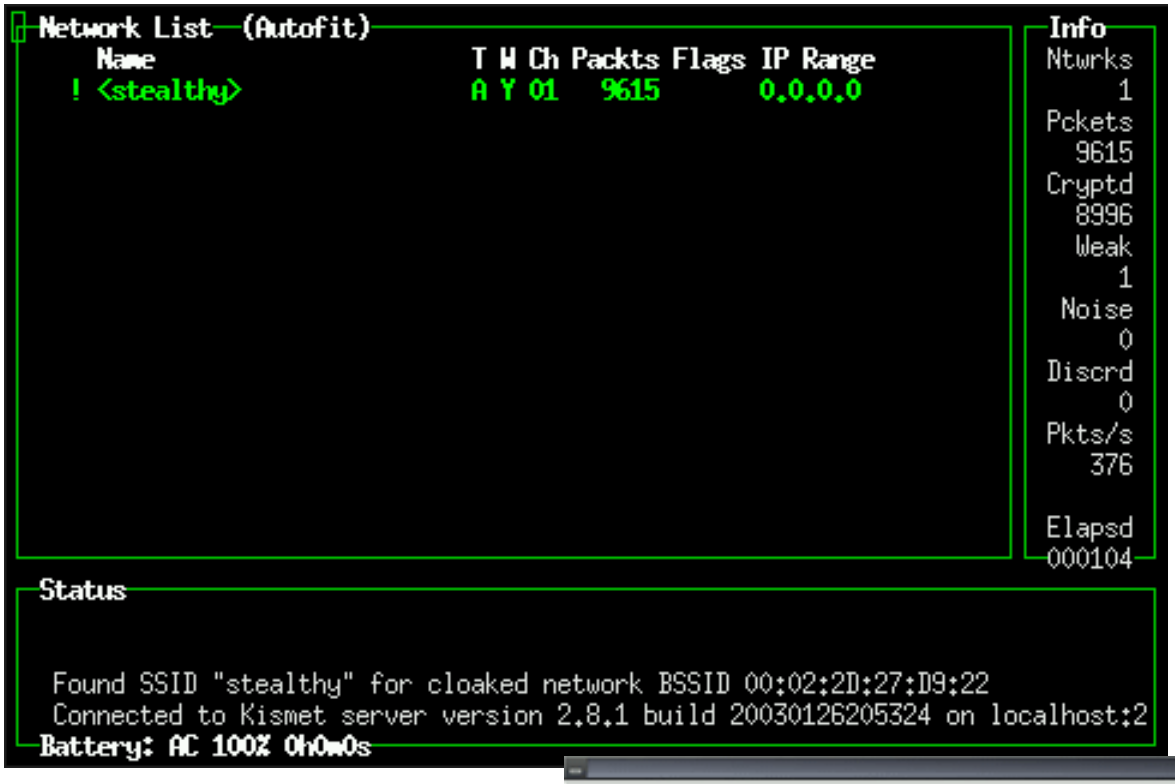
Federation for network access
eduroam
High-quality Internet for higher education and research

Wireless LAN is unsafe



root@ibook:~# tcpdump -n -i eth1

19:52:08.995104 10.0.1.2 > 10.0.1.1: icmp: echo request

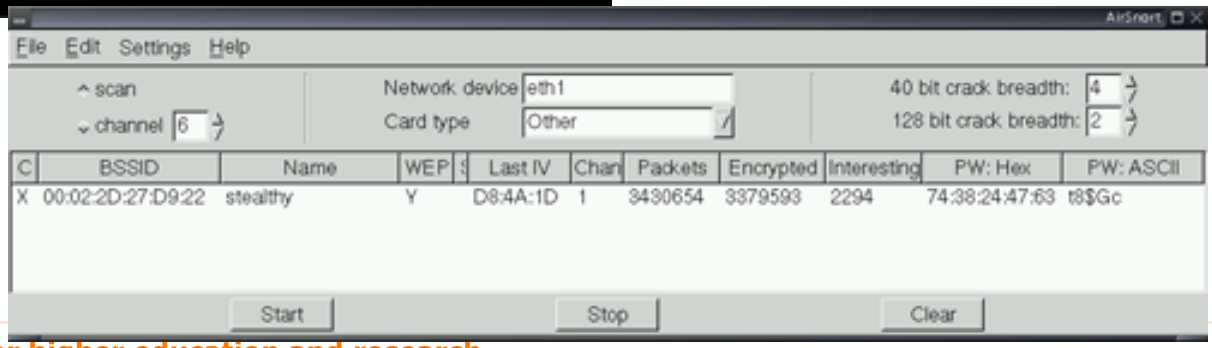
19:52:08.996412 10.0.1.1 > 10.0.1.2: icmp: echo reply

19:52:08.997961 10.0.1.2 > 10.0.1.1: icmp: echo request

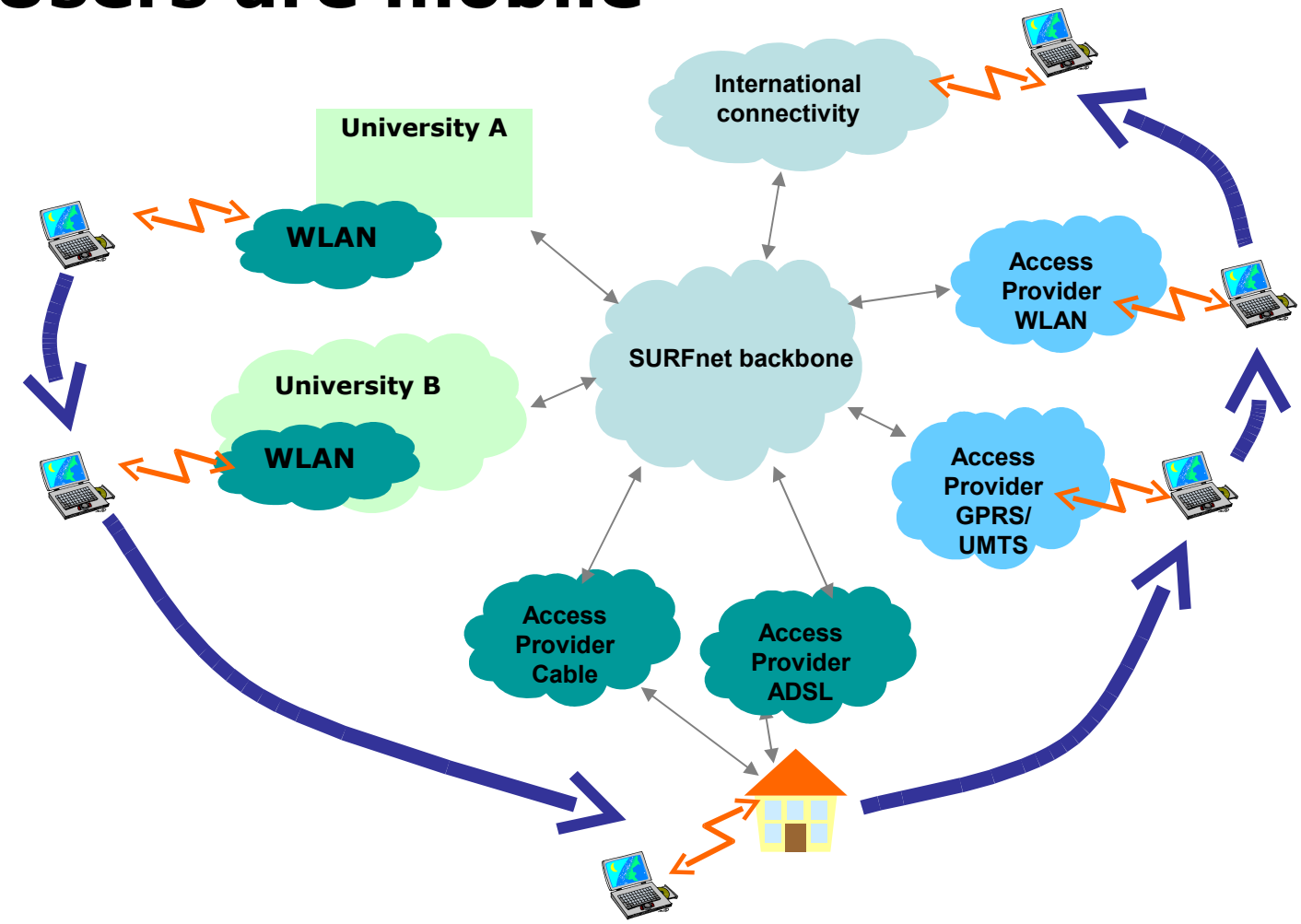
19:52:08.999220 10.0.1.1 > 10.0.1.2: icmp: echo reply

19:52:09.000581 10.0.1.2 > 10.0.1.1: icmp: echo request

19:52:09.003162 10.0.1.1 > 10.0.1.2: icmp: echo reply ^C



Users are mobile



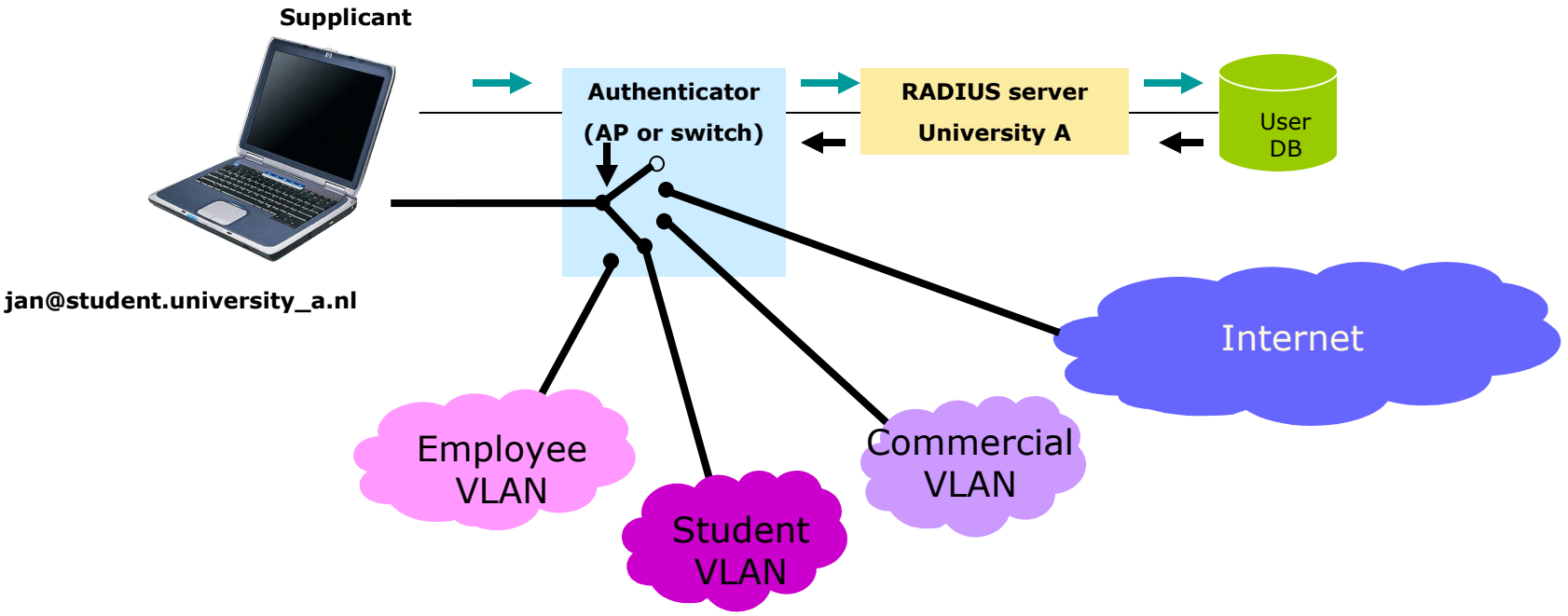
Requirements

- Identify users uniquely at the edge of the network
  - No session hijacking
- Enable guest usage
- Scalable
  - Local user administration and authentication
- Easy to install and use
  - At the most one-time installation by the user
- Open
- Secure

eduroam architecture

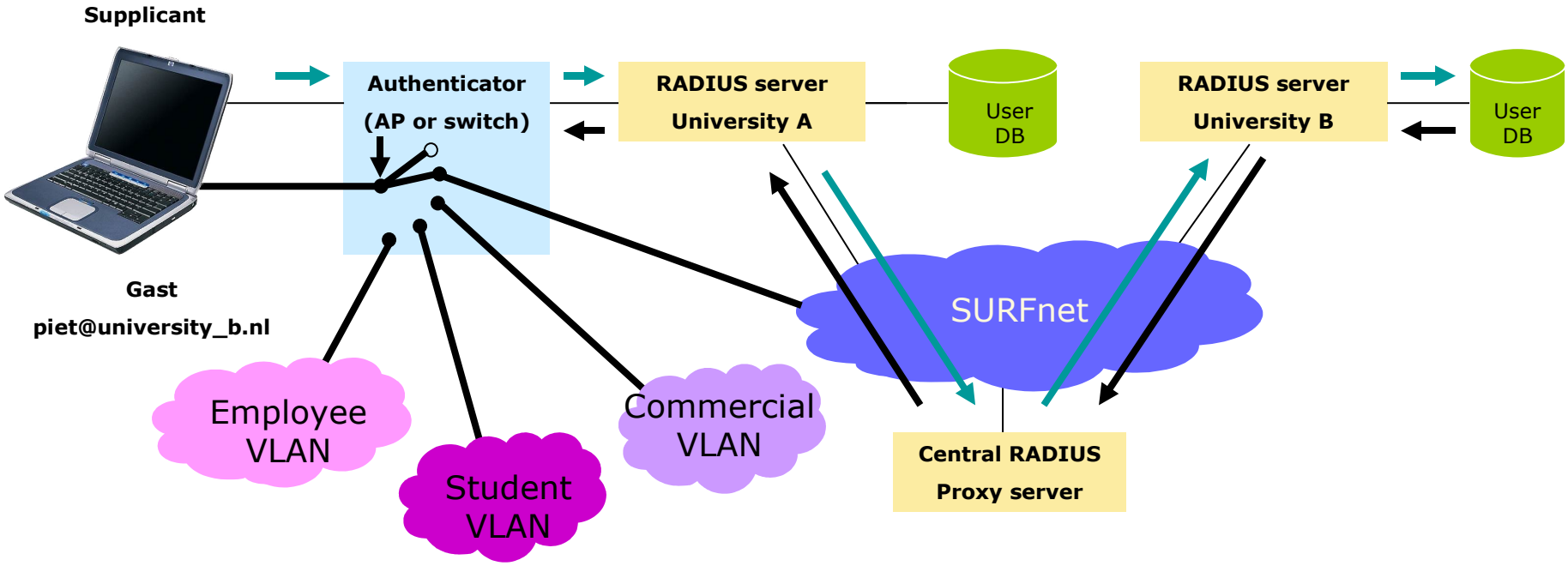
- Security based on 802.1X
  - Integration with VLAN assignment
  - Protection of credentials
  - Provides basis for new wireless security standards WPA and 802.11i
- Authentication based on EAP
  - Different authentication mechanisms possible by using EAP (Extensible Authentication prototcol)
    - Username/password
    - X.509 certificates
    - SIM-cards
- Roaming based on RADIUS proxying
  - Remote Authentication Dial In User Service
  - Transport-protocol for authentication information
- Trust fabric based on:
  - Technical: RADIUS hierarchy
  - Policy: Documents/contracts that define the responsibilities of user, institution, NREN and the EduRoam federation

Secure access to the network with 802.1X



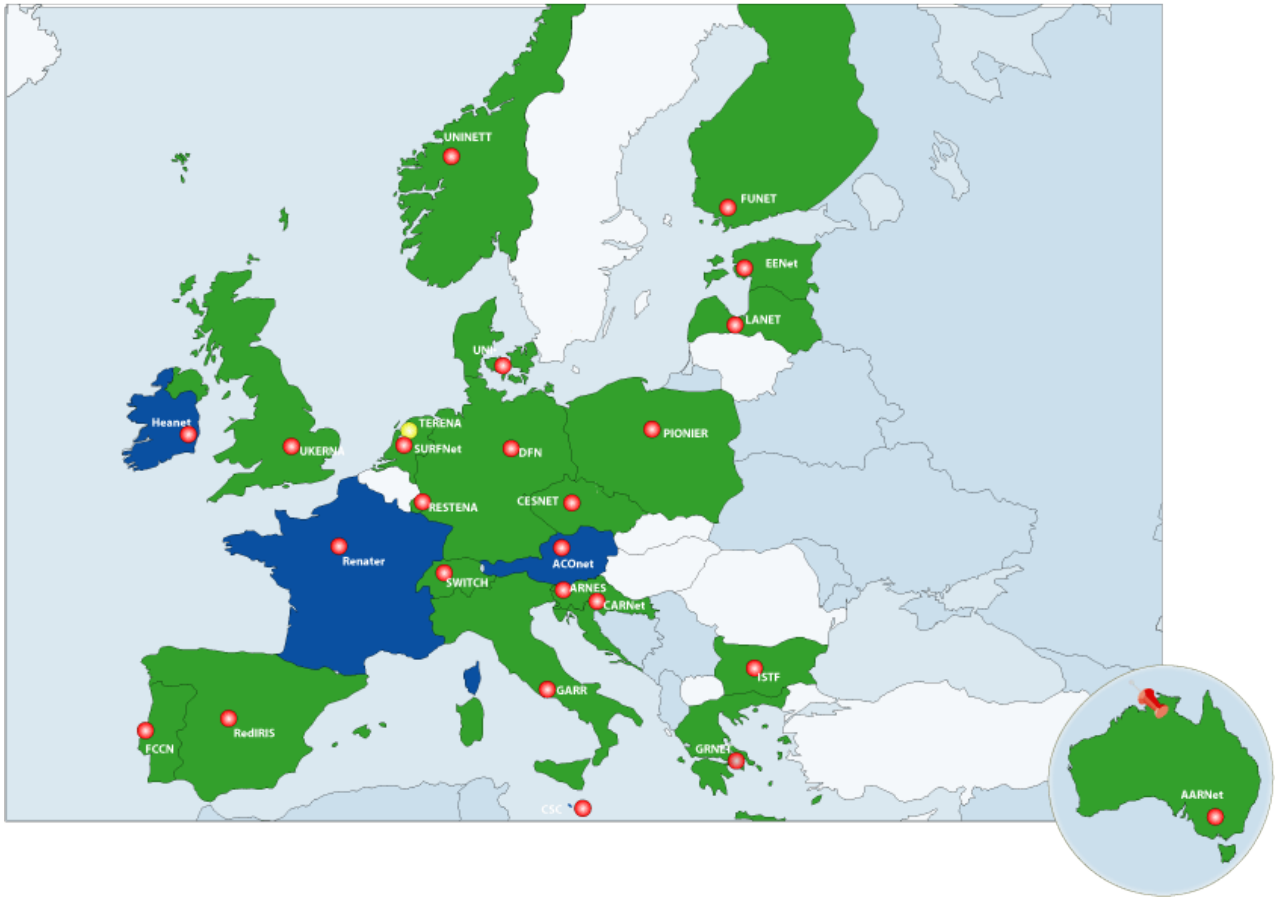
- 802.1X
- (VLAN assigment)

eduroam



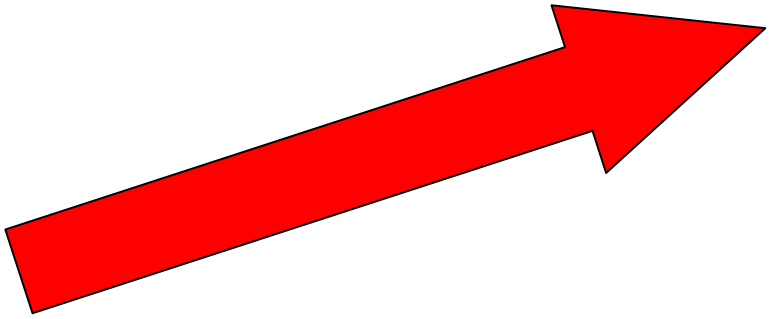
- Trust based on RADIUS plus policy documents
- 802.1X
- (VLAN assigment)

Status of *eduroam*



- Over 400 institutions in Europe, Australia and Taiwan
- USA, Sweden, Belgium will follow shortly

Members



nren	country	member_since
SURFnet	The Netherlands	2003-06-04
UKERNA	UK	2003-06-11
FCCN	Portugal	2003-06-30
CARNet	Croatia	2003-07-15
Funet	Finland	2003-07-31
DFN	Germany	2003-08-06
CESNET	Czech Republic	2004-05-26
GRNET	Greece	2004-05-27
Forskningsnettet	Denmark	2004-06-08
LANET	Latvia	2004-07-05
PIONIER	Poland	2004-07-14
UNINETT	Norway	2004-09-17
ARNES	Slovenia	2004-09-27
RedIRIS	Spain	2004-10-18
AARNet	Australia	2004-12-15
RESTENA	Luxembourg	2004-12-16
GARR	Italy	2005-02-04
ISTF	Bulgaria	2005-04-25
Internet2	USA	2005-04-26
RicerkaNet	Malta	2005-06-01
SWITCH	Switzerland	2005-06-23
EENet	Estonia	2005-10-04
aconet	Austria	2005-10-23
NCHC	Taiwan, R.O.C.	2005-10-26

- **TNC/CUC 2003: eduroam used for the first time at a conference**

eduroam

- Provides global network roaming
- Strong technical foundation:
  - RADIUS
  - 802.1X
  - Lingua Franca: EAP
- Needs ubiquity
- CARNet is ready for it, it’s now up to you!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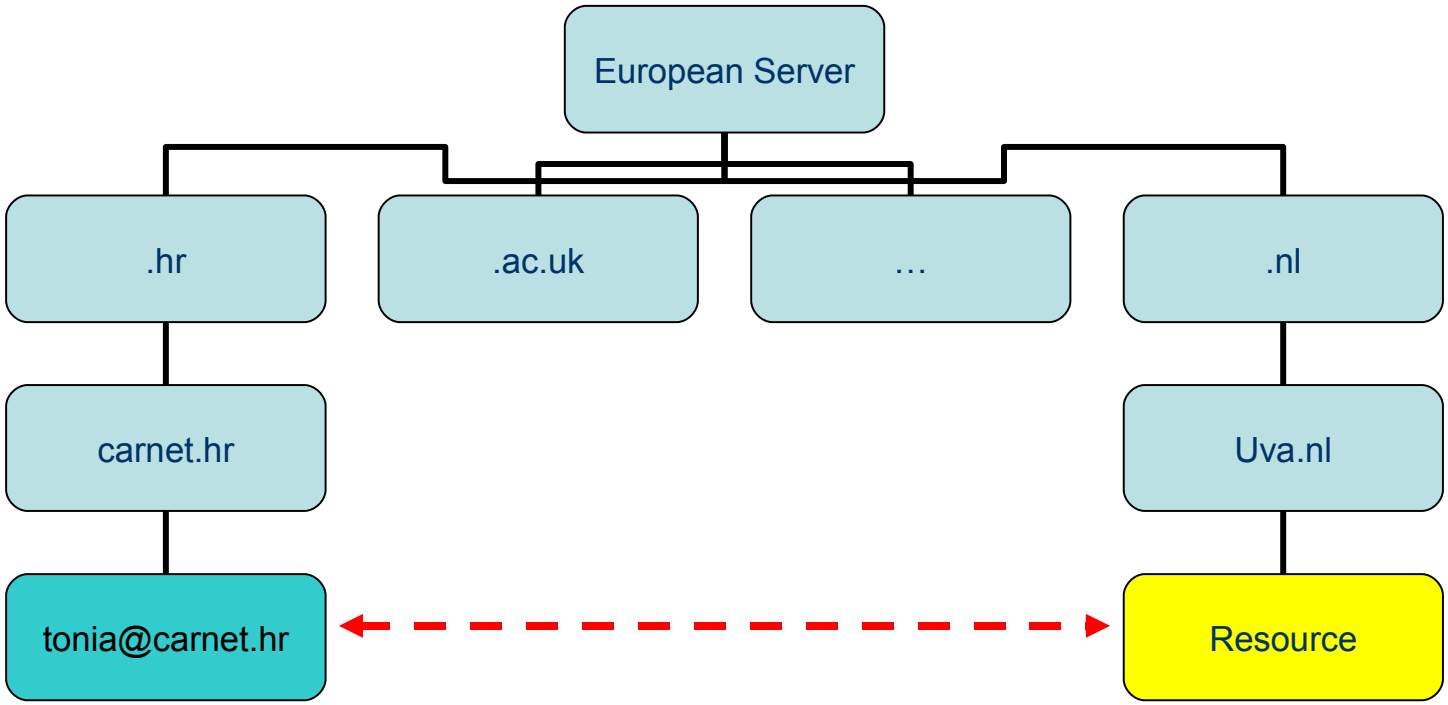
Federations for application access
eduGAIN
High-quality Internet for higher education and research

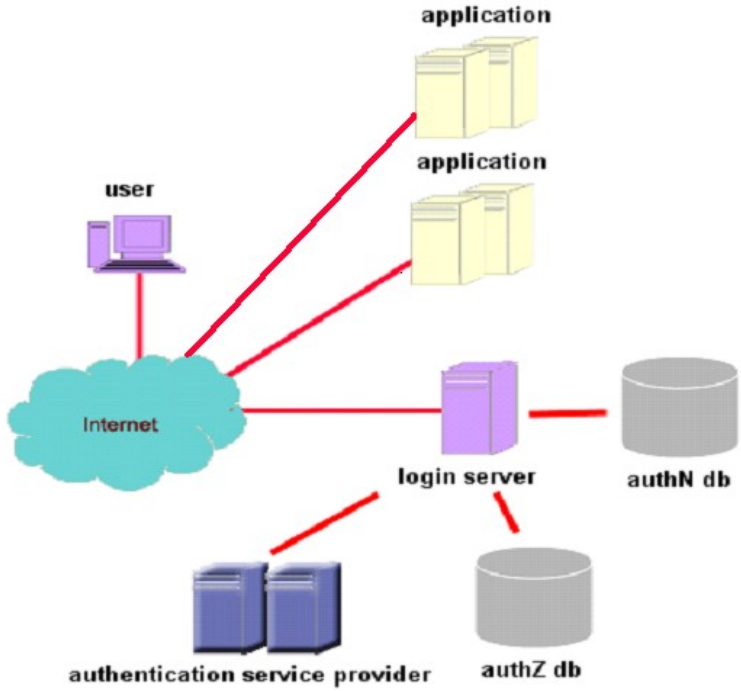
eduroam for application access?



- How do these applications communicate?
- How can you protect credentials?

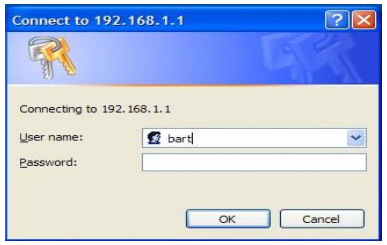
Centralise authentication: A-Select

- "Black box" that:
  - Accepts many authentication methods
  - Interfaces with many applications



eduroam

SURFKEY



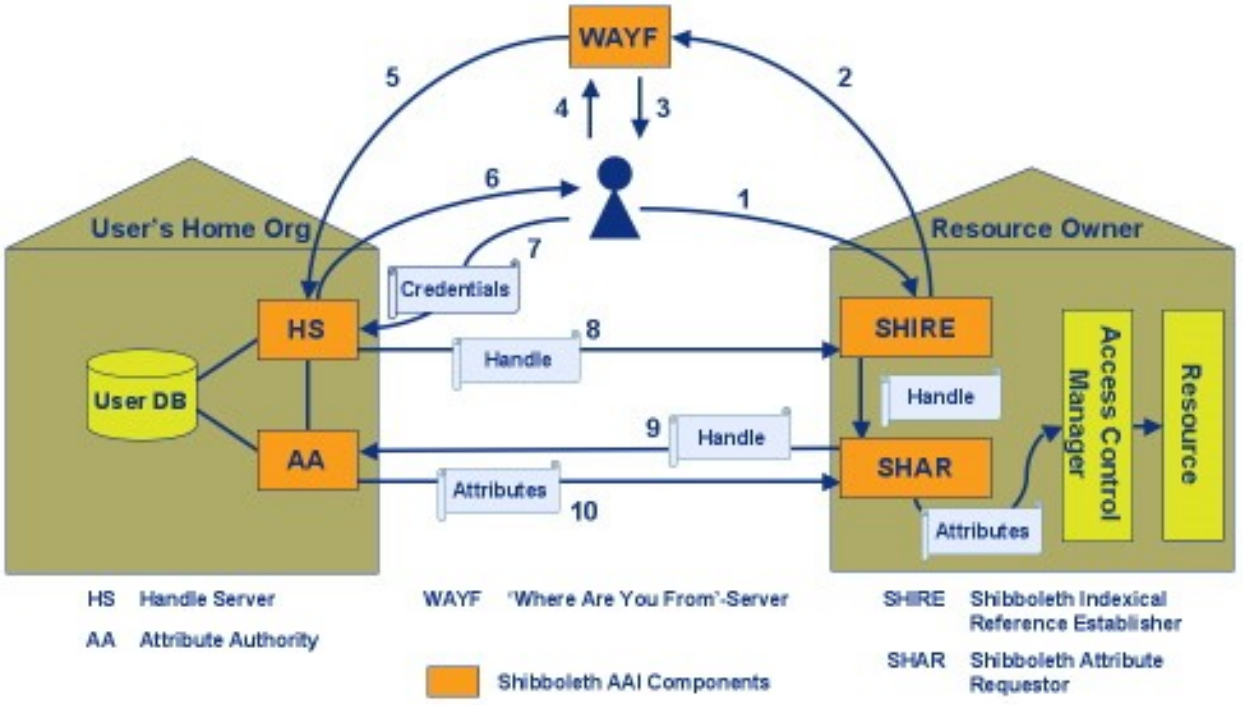
But…

- There are more:
  - PAPI
  - FEIDE/Moria
  - CAS
  - PingID
  - PERMIS
  - SPOCP

  - and… Shibboleth

- Do the pieces of the puzzle fit?

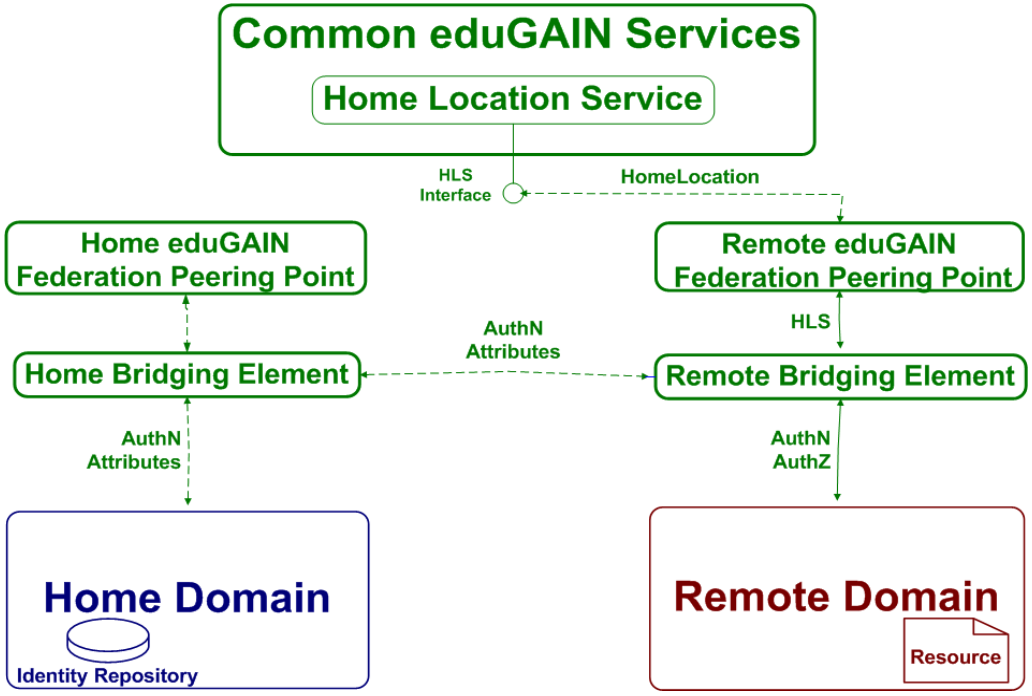
Shibboleth



- Allows institutions that belong to the same federation to share resources
- Lingua Franca: SAML

eduGAIN

- Goal: to federate federations
- **Web-services and SAML based**
- As much as possible Shibboleth compatible
- 4 basic interactions:
  - AuthnReq/Resp
  - HLSReq/Resp
  - AttrReq/Resp
  - AuthZReq/Resp
- Defining parameters, protocols and profiles



Existing solutions (Shibboleth, PAPI, A-Select etc.) will move to eduGAIN


SURFnet
Conclusions
High-quality Internet for higher education and research

Conclusions

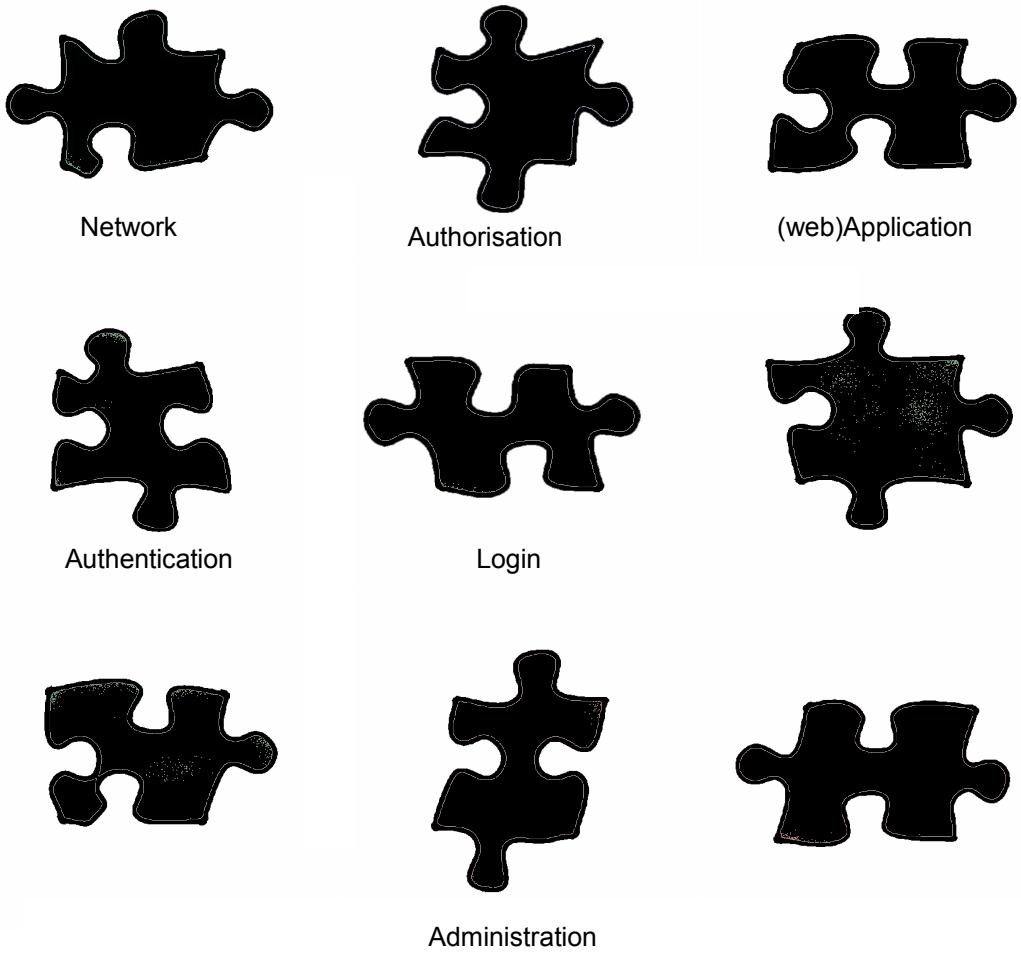
- To err is human, to federate is divine!

- Federation for network access: eduroam
- Federation for application access: eduGAIN

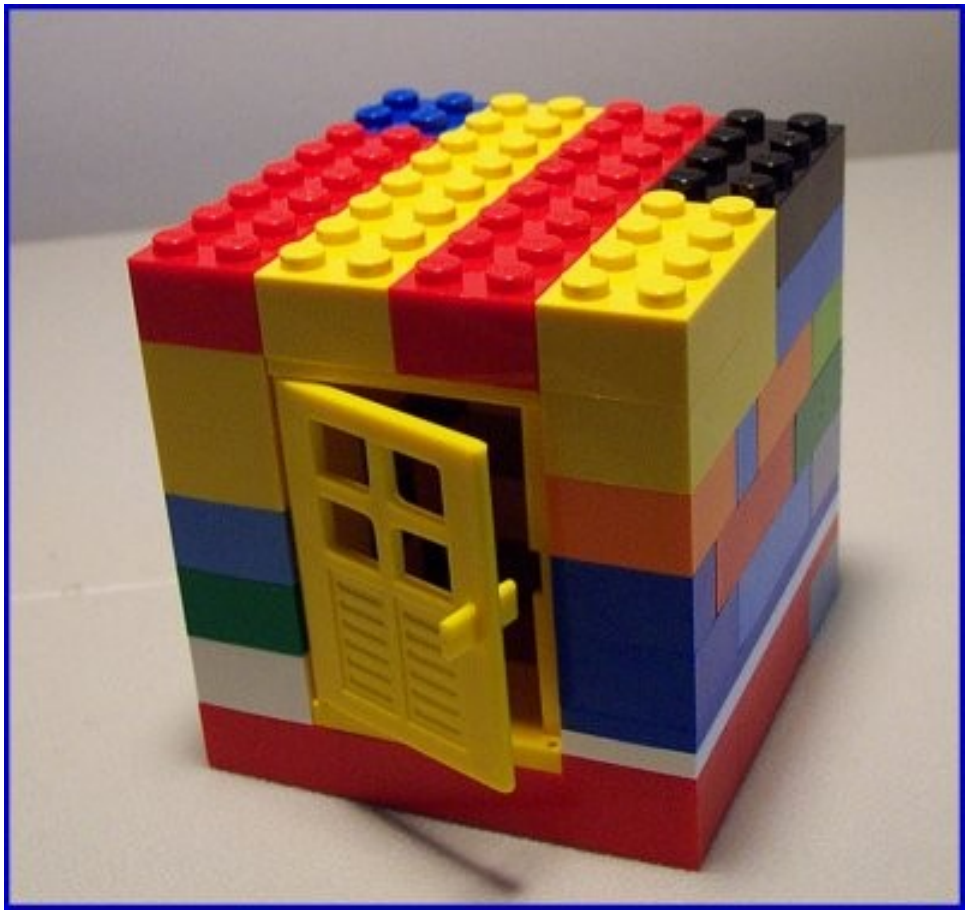
- So: join AAI@EduHr and……

use.....

Turn the puzzle…



Into…..



More information

- eduroam in SURFnet
  - http://www.eduroam.nl
- eduroam in Europa
  - http://www.eduroam.org
- TERENA TF-Mobility
  - http://www.terena.nl/mobility
- Géant2 Joint Research Activity 5 (authorisation and roaming)
  - http://www.geant2.net/ (click on research)
- The unofficial IEEE802.11 security page
  - http://www.drizzle.com/~aboba/IEEE