



SWITCH

The Swiss Education & Research Network

Study Trip of the Board

SWITCH - Presentation
Geneva, 11.10.05

SWITCH

The Swiss Education & Research Network

Foundation

Dr. Andreas Dudler

‘The foundation’s purpose is to establish, to foster, to offer, to participate in and to maintain the basis for an effective use of up-to-date methods of **teleinformatics in research and education in Switzerland**.

The foundation has no commercial targets, nor is it aligned with profit-making.’

History

1986-1989	Establishment
1990-1995	Development phase
1996-1999	Consolidation phase
2000-2004	New strategic orientation

Users

Students

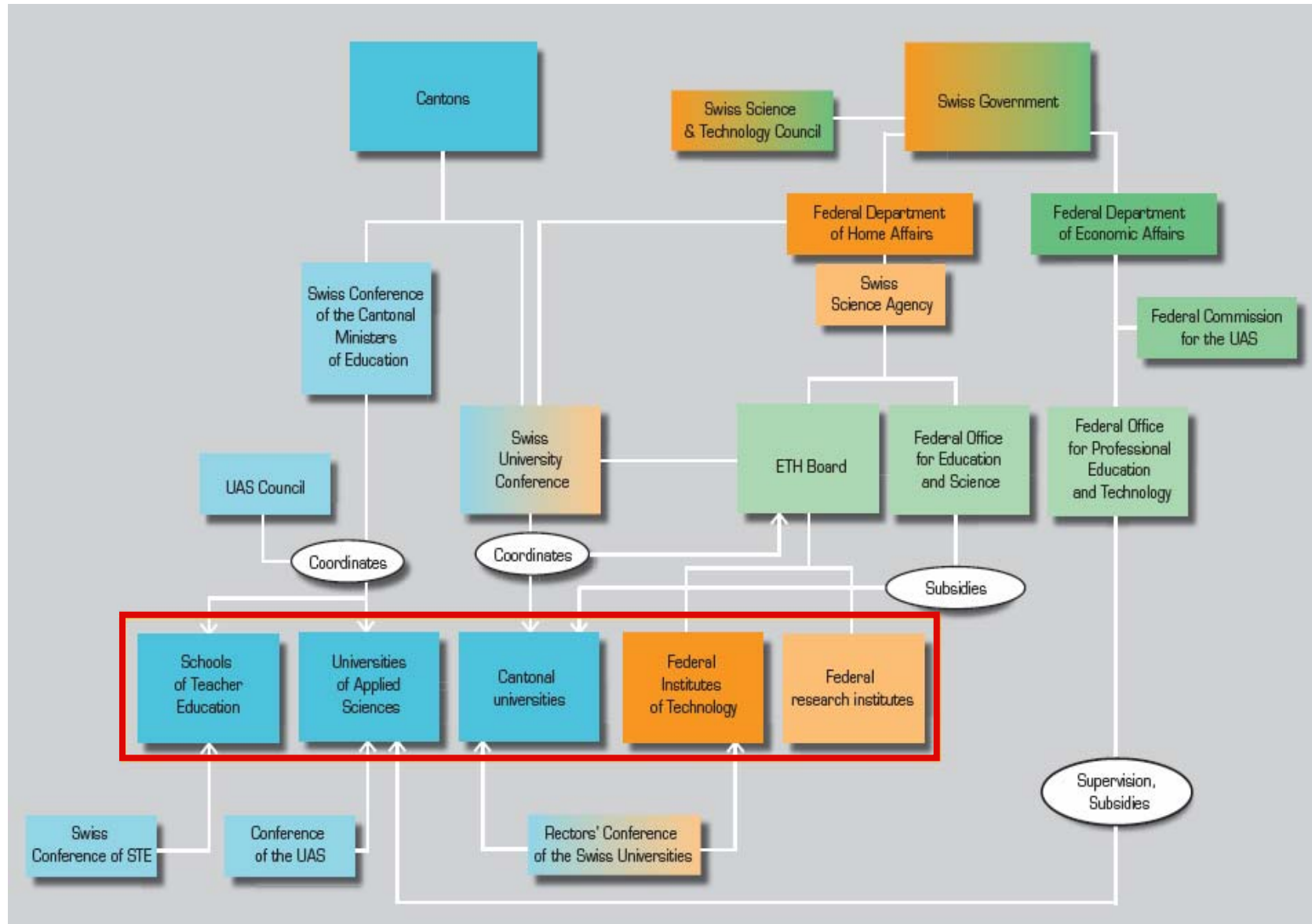
UNIs 90'000

SFIT 19'000

UAS 45'000

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

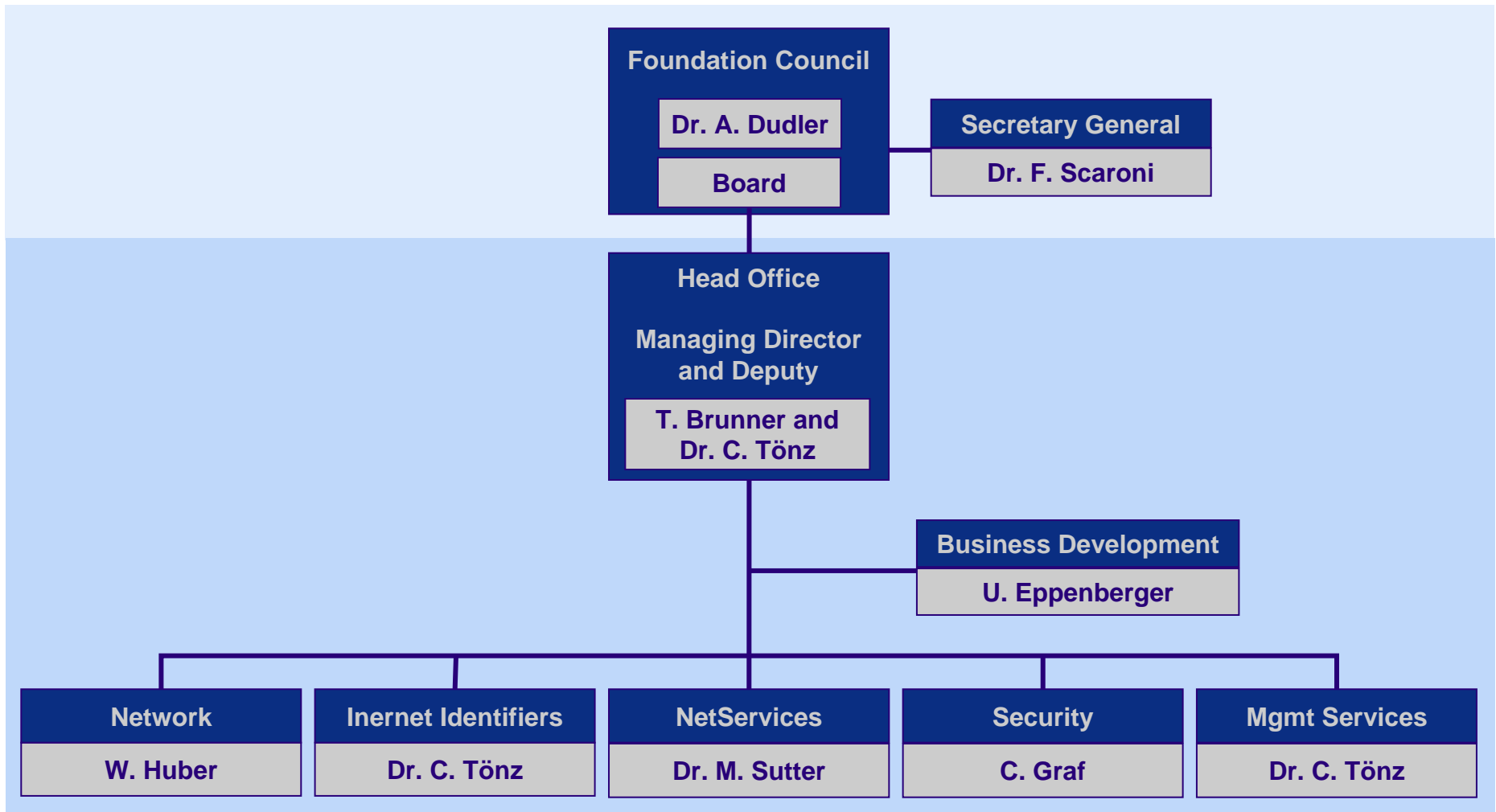
Environment





- Long term **investment in fibre optic** for a sustainable network infrastructure
- Development of **innovative applications and services** for the **cooperative work** in education and research
- Security services for the **protection of critical information infrastructure**
- **Technical and financial synergies** with the domain name registration activities

Organisation



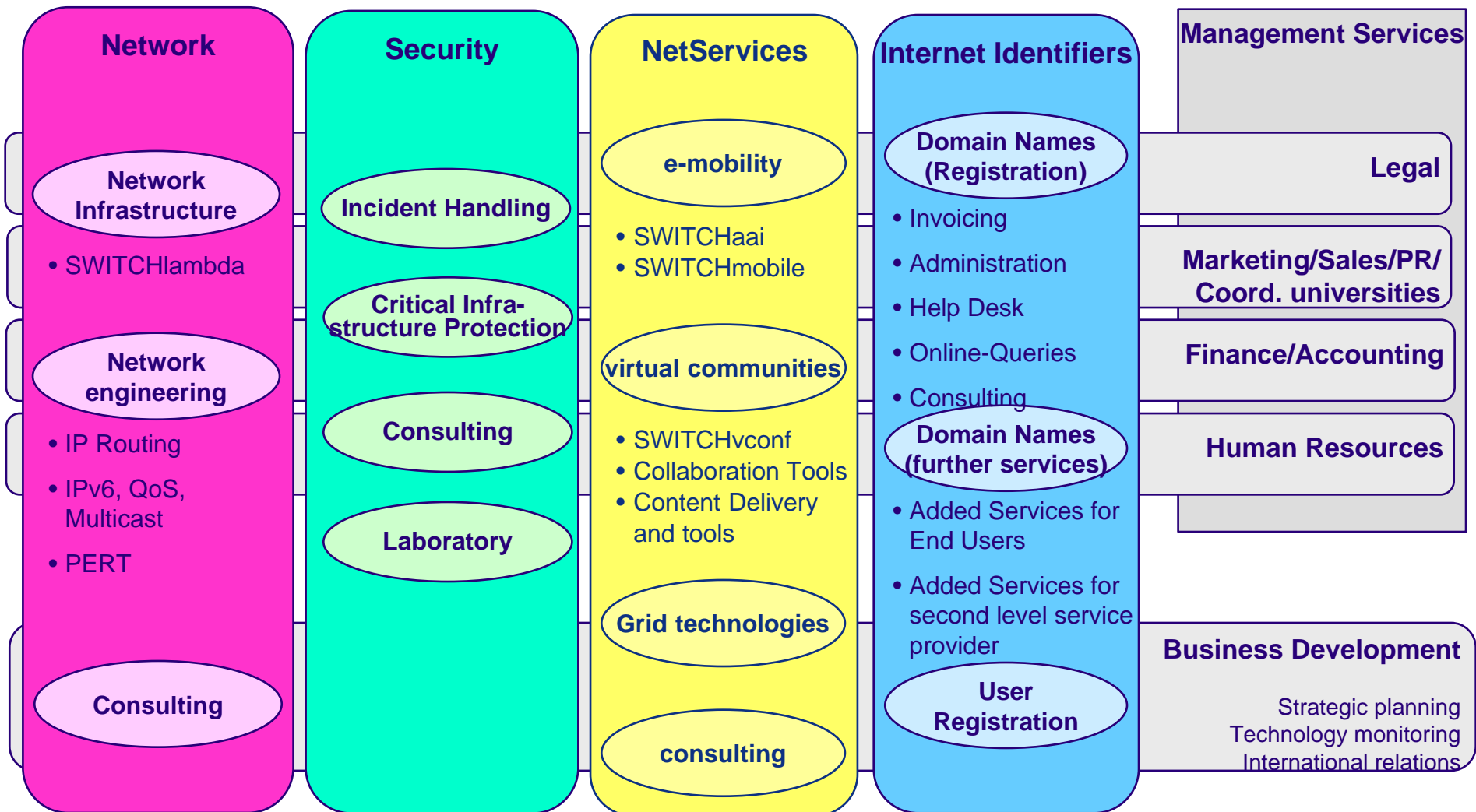
SWITCH

The Swiss Education & Research Network

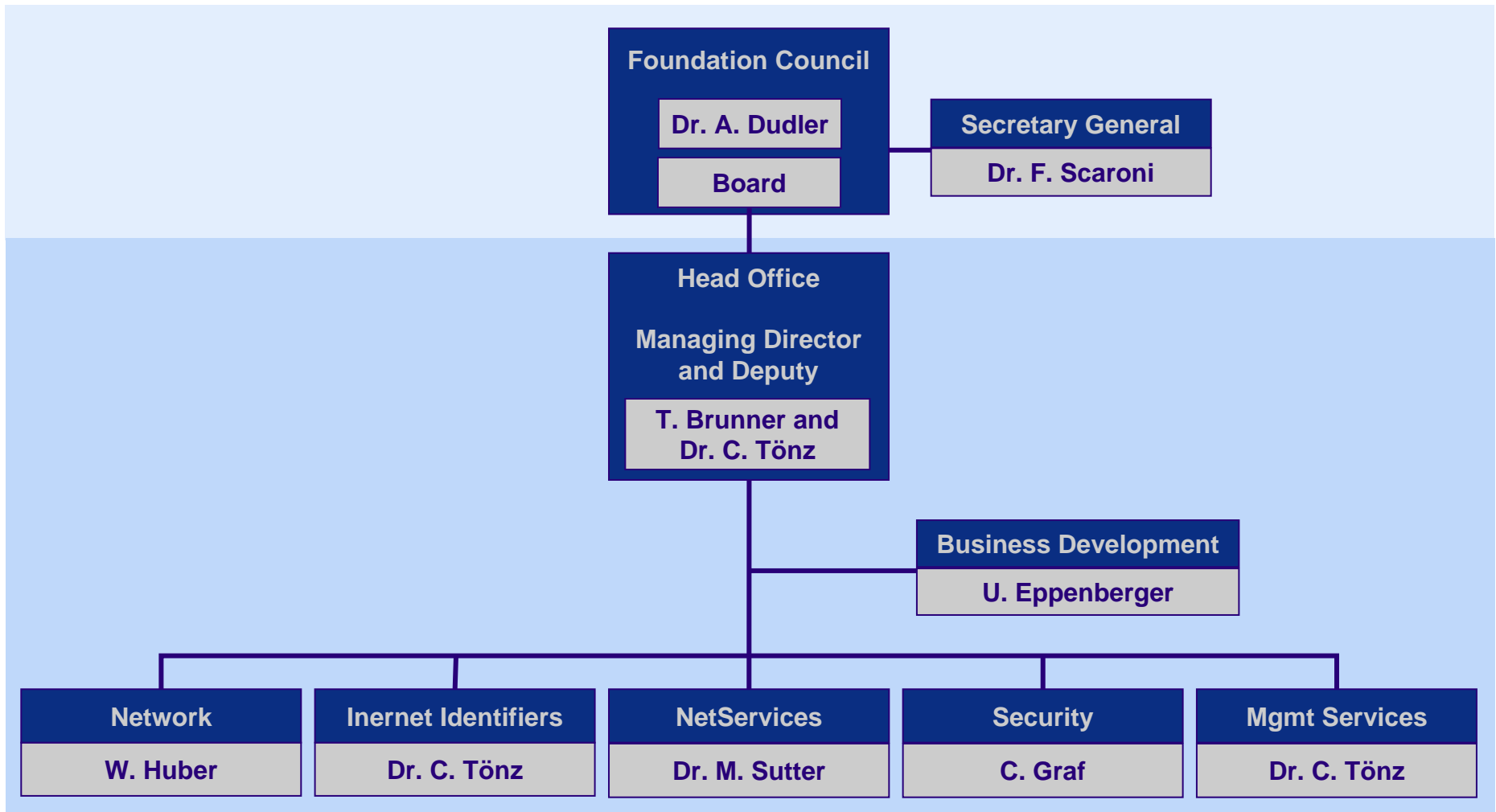
Head Office

Thomas Brunner

Organisation



Organisation



Basic principle:

Solidarity

Operational policies:

Subsidiarity

Long term, sustainable investments

Early detection and anticipation of new requirements

Focus on cutting edge technologies and services

Intensive cooperation with all Swiss universities

Communication and coordination at national level

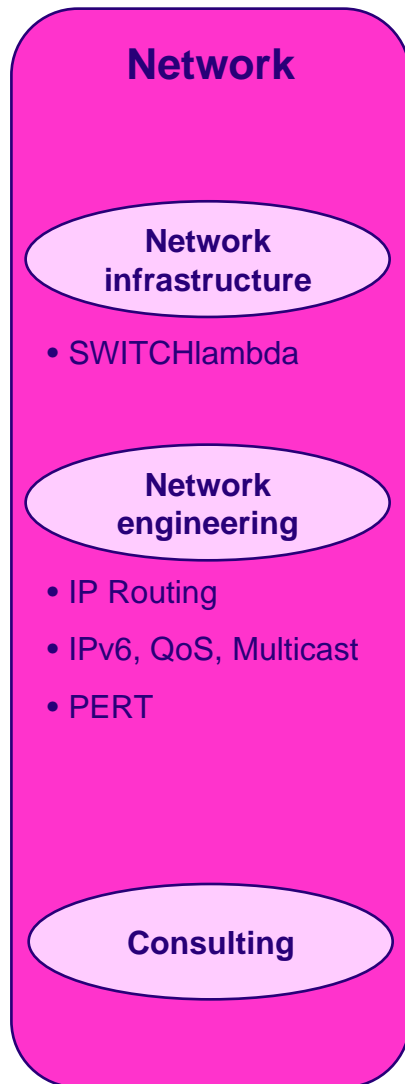
Strong international presence

SWITCH

The Swiss Education & Research Network

Network

Willi Huber



- Network infrastructure
 - Plan, build, operate the national network for the Swiss education and research community
- Network engineering
 - IP-service (IPv4, IPv6, Multicast)
 - Connectivity (national, international)
 - IP address space allocation (RIPE NCC)
 - Point-to-point service
 - PERT (performance enhancement and response team)
 - Technology watch
- Consulting
 - Helpdesk, workshops, tutorial about network related issues

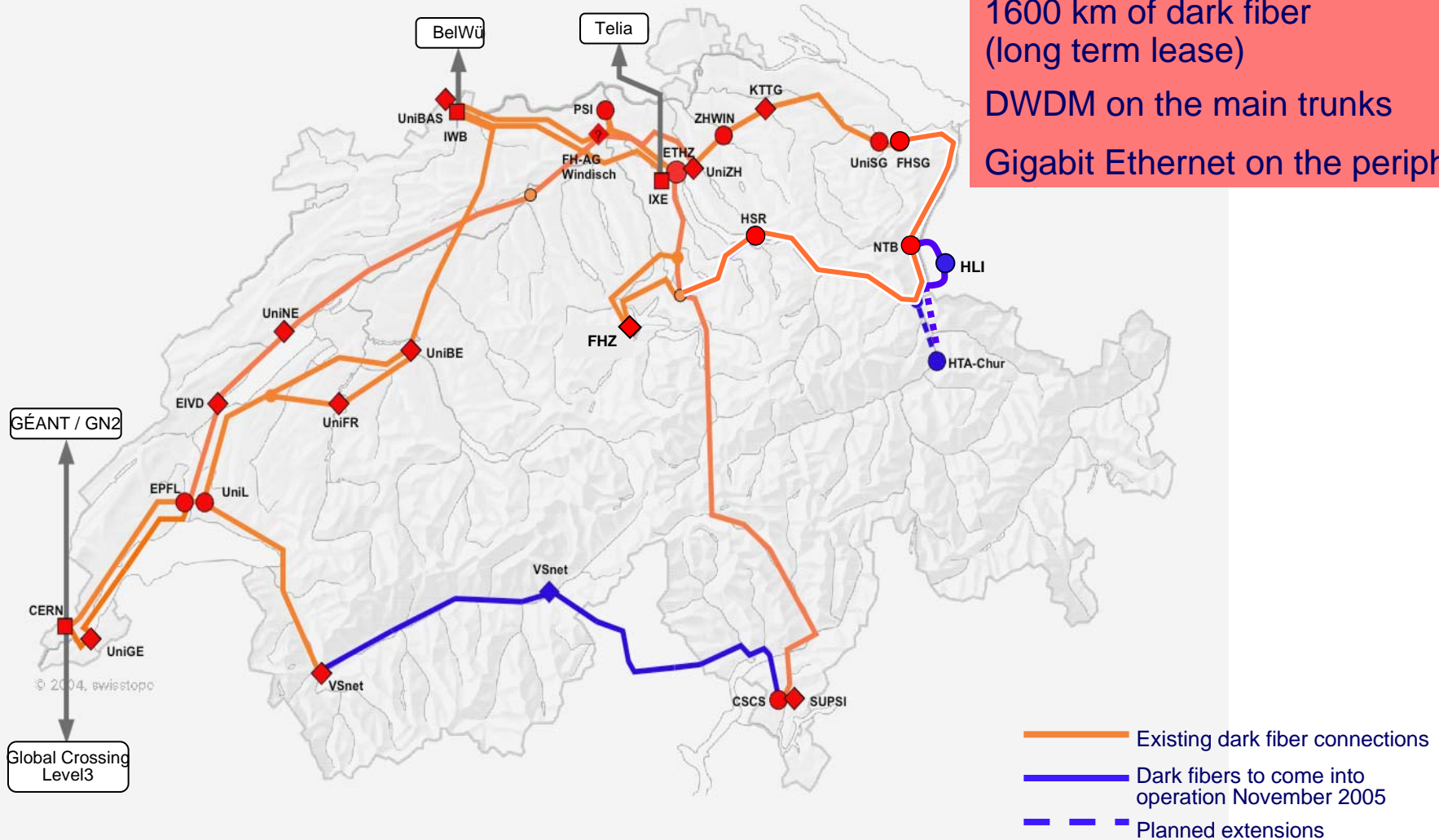
**Provide a stable, high performant and modern network
for education and research in Switzerland.**

Current main activities to achieve this goal:

- SWITCHlambda: network based on leased dark fiber
 - Long living fiber based network infrastructure
 - High performance, Innovative services
 - Fix costs, mainly independent on implemented bandwidth
- PERT (Performance Enhancement and Response Team)
 - End-to-end quality control of network performance

SWITCHlambda Backbone

1600 km of dark fiber
(long term lease)
DWDM on the main trunks
Gigabit Ethernet on the periphery



PERT manifesto (2003): “Conceptual team that provides assistance with the resolution of end-to-end performance problems for networked applications, and contributes to research in the area of end-to-end performance issues.”

Help end-users to achieve good network performance

Analysis of network connections, isolation of problem (application, LAN, firewall, WAN, ...), recommendation for improvements

Support over several network management domains

Provision of performance measurement tools for end-users

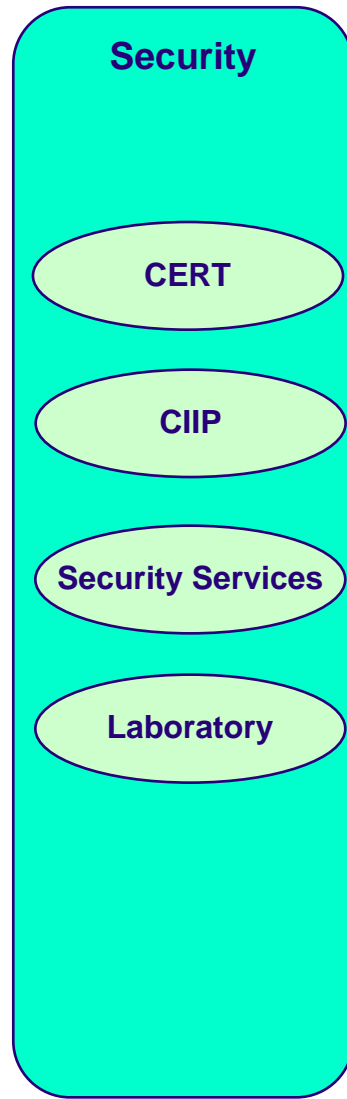
Education of users (bandwidth-delay product)

SWITCH

The Swiss Education & Research Network

Security

Christoph Graf



- CERT**

- Proactive CERT tasks (information services, community building)
 - Reactive CERT tasks (security helpdesk, incident handling and coordination)

- Critical Information Infrastructure Protection (CIIP)**

- Threat/risk analysis
 - Crisis management support

- Security Services**

- SWITCHpki: PKI services
 - Anomaly detection, malware signature sensing (NFSEN)
 - Internet threat related consulting

- Laboratory**

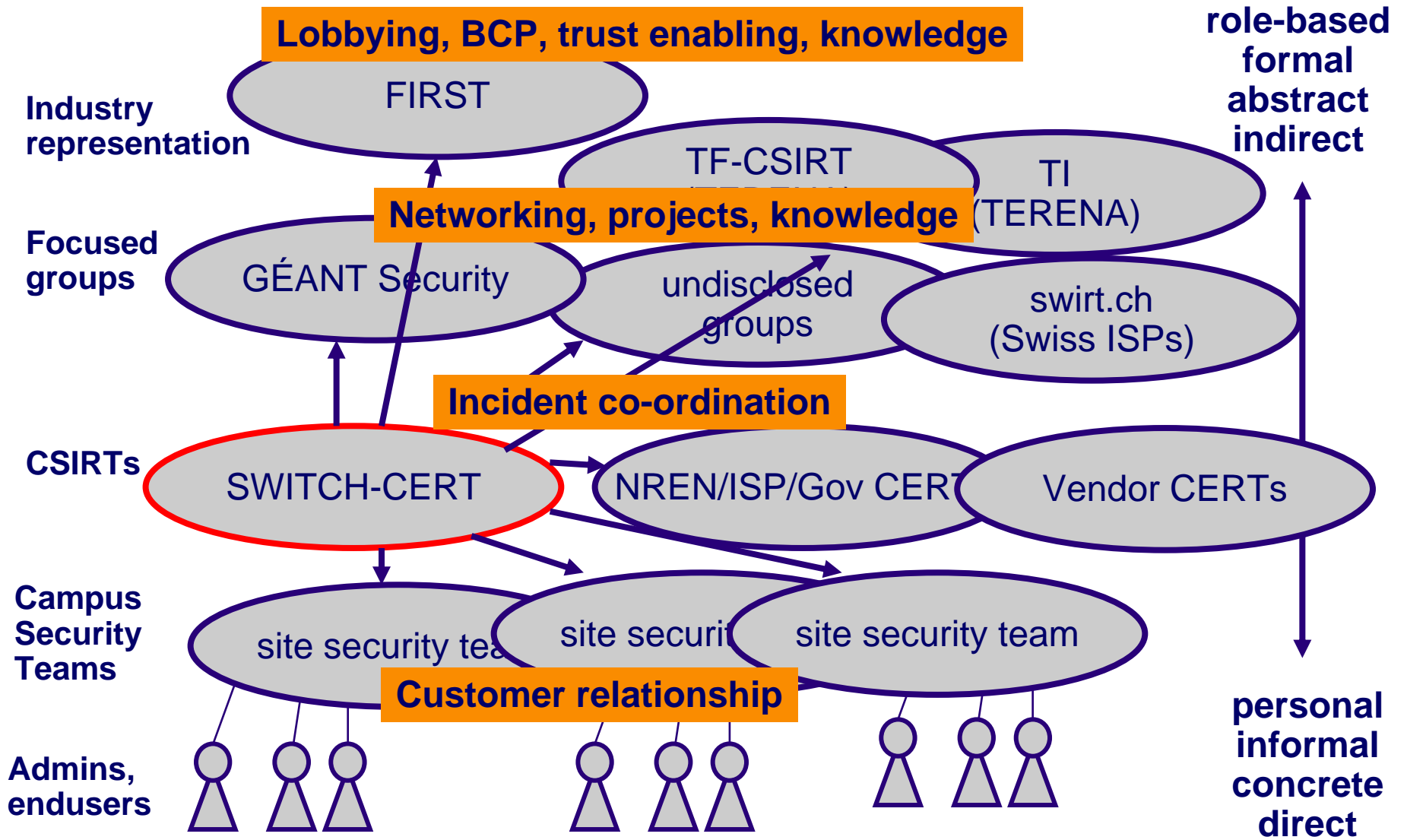
- Malware analysis lab
 - Network sensor development
 - Security research collaboration

**Make our stable, high performant and modern network
*a secure network for education and research users in
Switzerland.***

Current main activities to achieve this goal together with our customers:

- Security Tools and Services: e.g. Nfsen
The network security „Swiss Army Knife“
- SWITCH-CERT
An active member of the network security community
- SWITCHpki
X.509 certificates, wherever they make sense

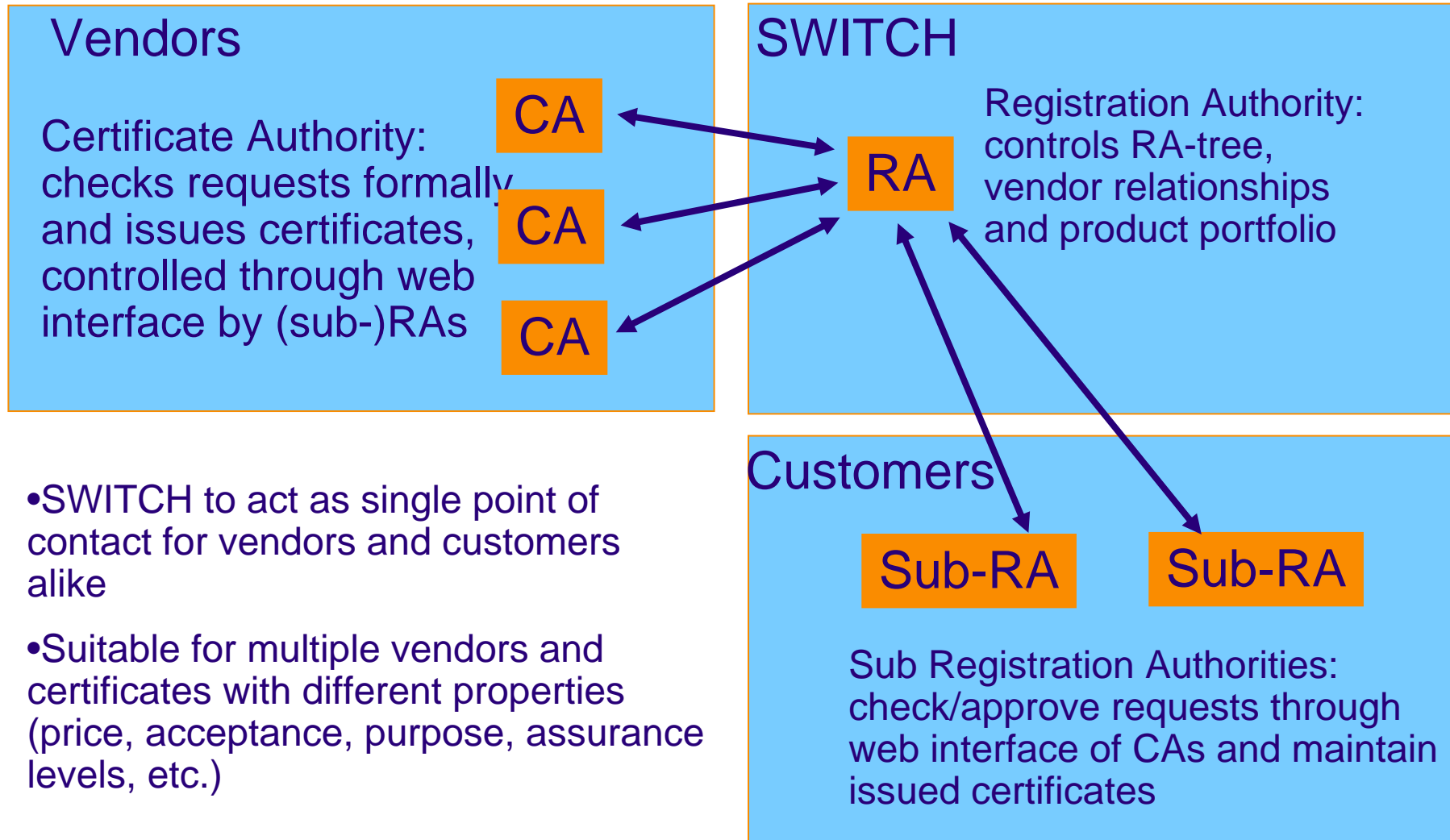
CERT Security Landscape



SWITCHpki Service Concept

Technical components

Organisational structures

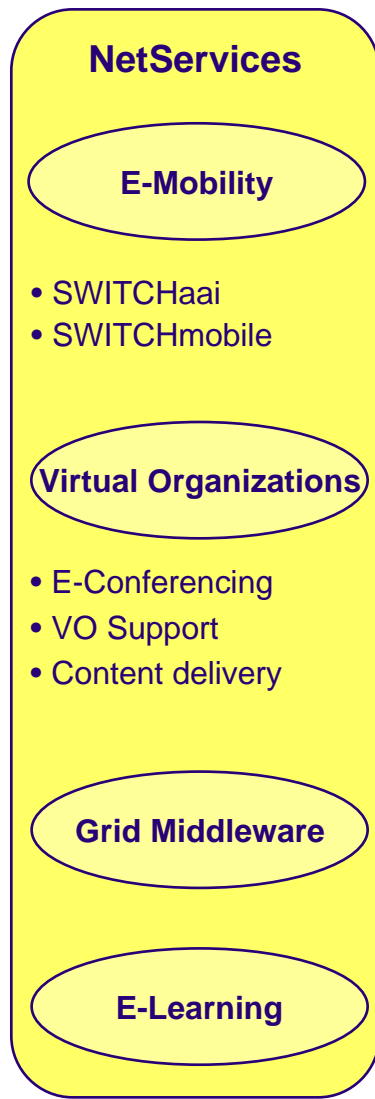


SWITCH

The Swiss Education & Research Network

NetServices

Dr. Martin Sutter



- e-Mobility / Access Support
 - SWITCHaai Authentication and authorization infrastructure (virtual mobility)
 - SWITCHmobile: ubiquity & roaming support (physical mobility)
- End User Services & Support of Virtual Organizations
 - Services for VOs (synchronous / asynchronous communications, tools for collaboration, VO support center)
 - Content delivery services, CoD
- Grid middleware: AAI-enabled grid software
 - EGEE-2 cooperation
 - National Grid support
- E-Learning support
 - National course platform

e-Academia

“Our vision is e-Academia: a community of students, researchers and teachers which takes the free flow of ideas, the exchange of discoveries and the scientific debate into the digital world.”

Taken from the “AAI Concept”:
<http://www.switch.ch/aai/concept.html>, 2001

Access / e-Mobility

Security (AAI, PKI)
Ubiquity & Roaming

Virtual Organizations

Communication & Collaboration
Content Delivery

Grid Middleware
E-Learning

Network Infrastructure
Security Services

Basic Internet Services (NetNews, Domain Names, other)

NetServices:
Middleware & End User Services

Generic
Services

SWITCHaai = federated, national Shibboleth-based authorization and authentication infrastructure (AAI).

Main efforts:

- > 110'000 users ($\approx 50\%$) of the Swiss higher education sector are currently "AAI-enabled".
- Federally funded cooperation projects will complete the national roll-out and increase the number of new resources.
- Define cooperation with other federations.
- Develop accounting (AAAI) services.

Grid support = new strategic direction: national AAI-enabled grid infrastructure in Switzerland.

Two main strategic efforts:

- Within the context of EGEE-2 we want to add interoperability between Shibboleth and the gLite middleware stack.
- Within the national context we want to work together with our partners (universities, computing centers) to build up such a national grid infrastructure based on the AAI-enabled gLite middleware.

Support of virtual organizations = tools for communication and cooperations, other core middleware.

Main efforts:

- Synchronous & asynchronous communication
 - e-conferencing (videoconferencing, collaboration tools, streaming)
 - mailing lists, shared calendars, directory services, etc.
- Collaboration
 - document management, web access & publication, workflow, etc.
 - VO support center
- E-Learning Support

SWITCH

The Swiss Education & Research Network