

Study Trip of the Board

SWITCH - Presentation Geneva, 11.10.05



The Swiss Education & Research Network

Foundation

Dr. Andreas Dudler

Deed of Foundation



'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



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

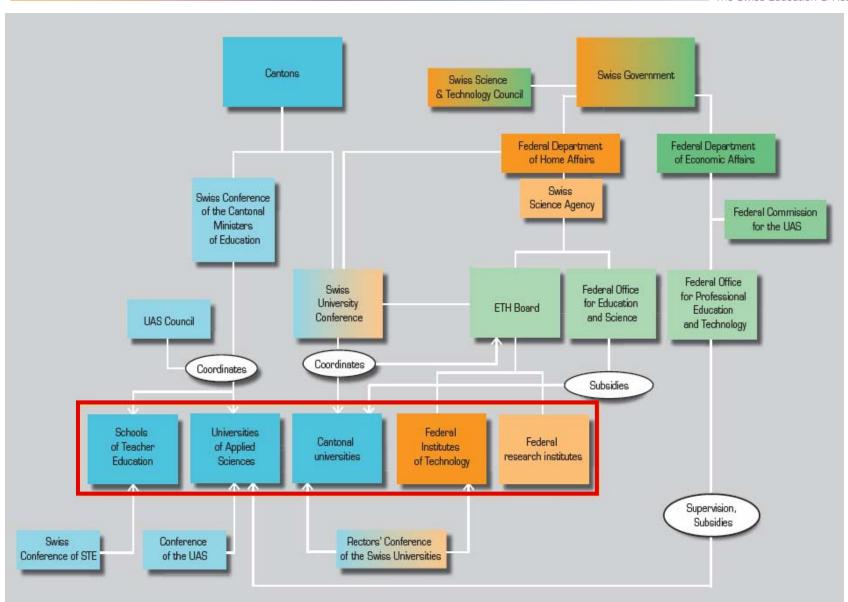
UAS 45'000

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

Environment

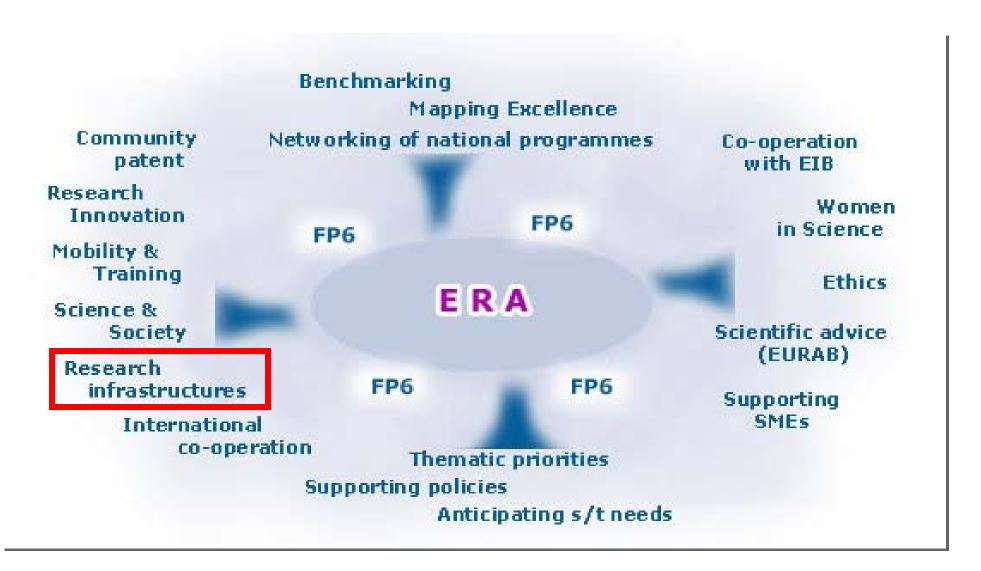


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International Relations





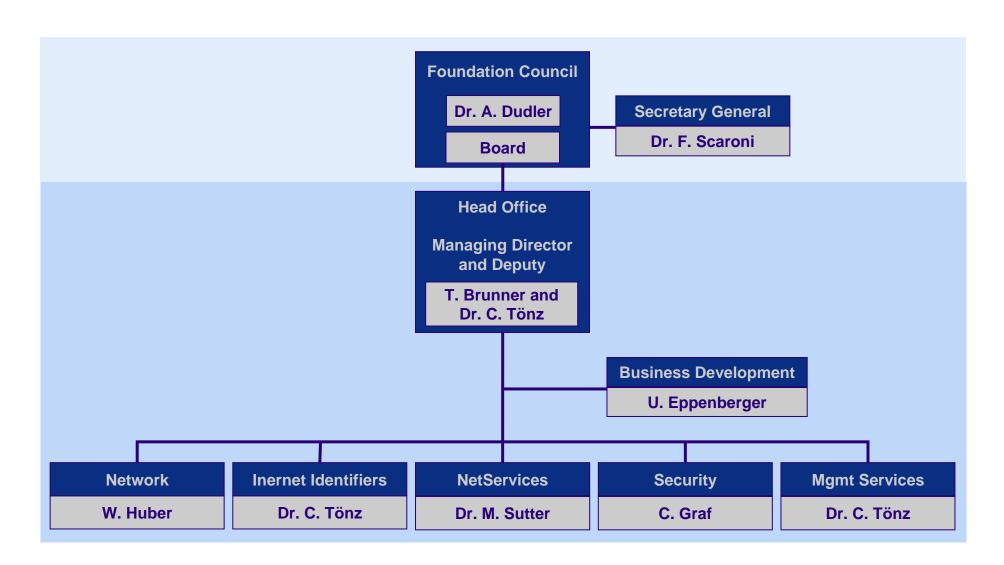
Strategic Realignment 2001



- 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







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Head Office

Thomas Brunner

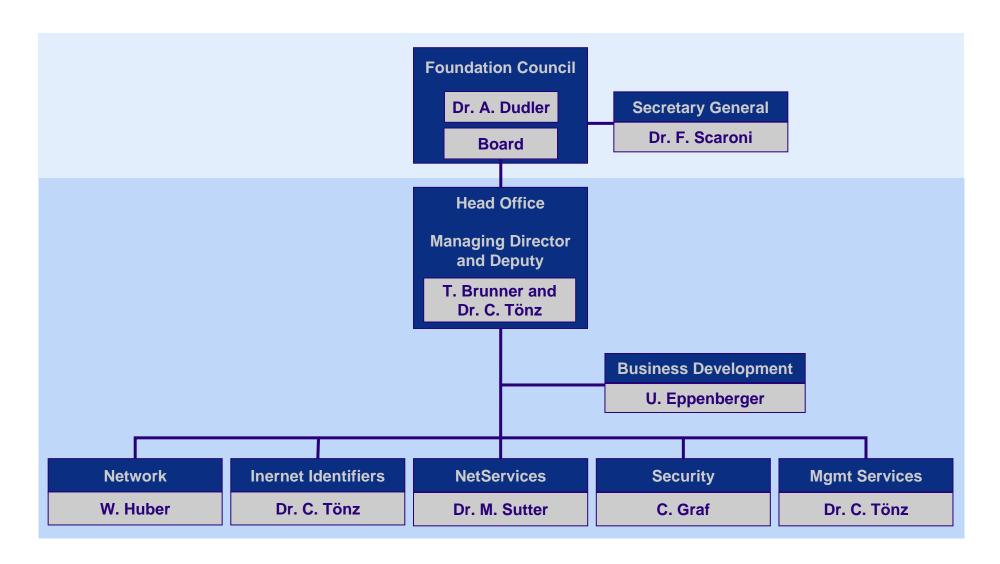
Organisation



Management Services Network Security NetServices Internet Identifiers **Domain Names** e-mobility Legal (Registration) **Network Incident Handling** Infrastructure Invoicing • SWITCHaai Marketing/Sales/PR/ Administration • SWITCHlambda • SWITCHmobile **Coord.** universities **Critical Infra-** Help Desk structure Protection • Online-Queries Finance/Accounting **Network** virtual communities engineering Consulting Consulting **Domain Names** SWITCHvconf • IP Routing **Human Resources** (further services) Collaboration Tools • IPv6, QoS. Content Delivery Added Services for Multicast and tools Laboratory **End Users** PERT Added Services for second level service **Grid technologies** provider **Business Development** User Consulting Strategic planning Registration Technology monitoring consulting International relations

Organisation





Rules of Conduct



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



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Network

Willi Huber

Tasks of Business Unit Network



Network

Network infrastructure

SWITCHlambda

Network engineering

- IP Routing
- IPv6, QoS, Multicast
- PERT

Consulting

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

Strategy of Network



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

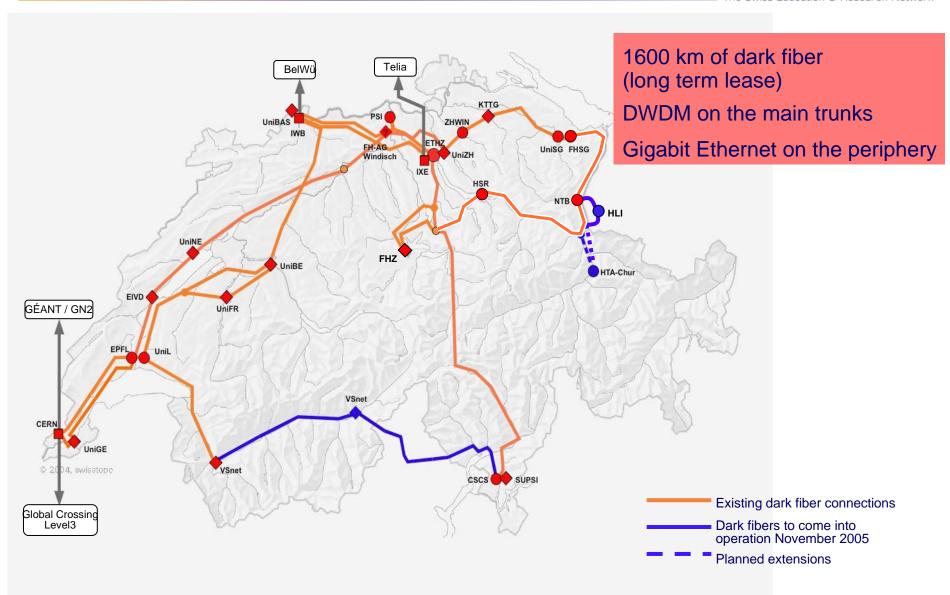
Current main activities to achieve this goal:

- •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



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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)



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Security

Christoph Graf

Tasks of Business Unit Security



Security CERT CIIP Security Services Laboratory

•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

Strategy of Security



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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

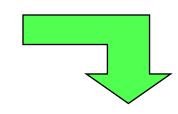
X.509 certificates, wherever they make sense

Nfsen in Action



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From the big picture to the needle in the haystack

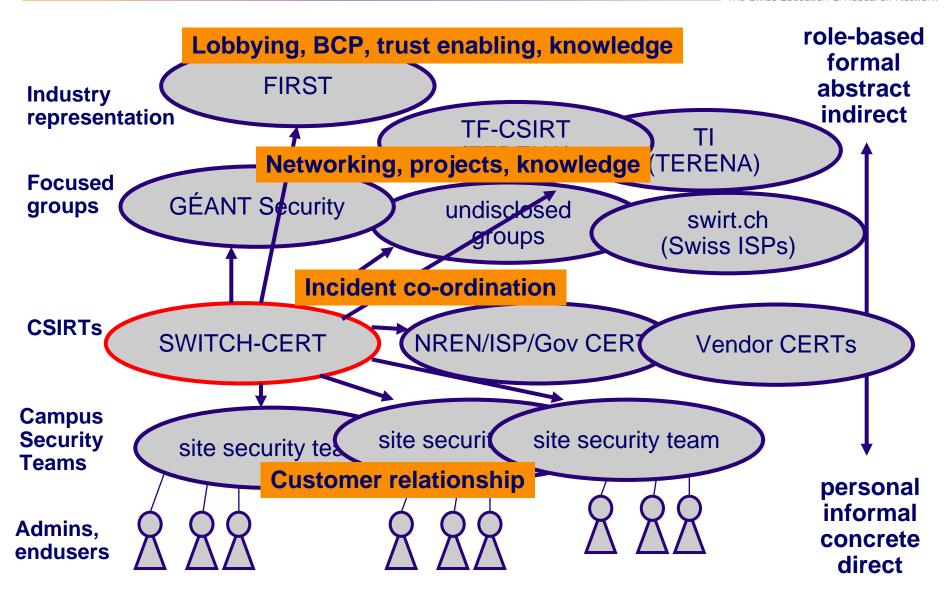




CERT Security Landscape



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SWITCHpki Service Concept



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Technical components

Organisational structures

Registration Authority:

vendor relationships

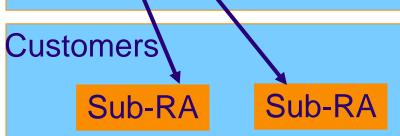
and product portfolio

controls RA-tree,

SWITCH



- •SWITCH to act as single point of contact for vendors and customers alike
- •Suitable for multiple vendors and certificates with different properties (price, acceptance, purpose, assurance levels, etc.)



Sub Registration Authorities: check/approve requests through web interface of CAs and maintain issued certificates



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NetServices

Dr. Martin Sutter

Tasks of Business Unit NetServices



NetServices E-Mobility SWITCHaai SWITCHmobile (Virtual Organizations E-Conferencing VO Support Content delivery **Grid Middleware** E-Learning

- 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."

e-Academia



Access / e-Mobility

Virtual Organizations

Security (AAI, PKI)
Ubiquity & Roaming

Communication & Collaboration
Content Delivery

Grid Middleware
E-Learning

NetServices: Middleware & End User Services

Network Infrastructure Security Services

Basic Internet Services (NetNews, Domain Names, other)

Generic Services

Strategic Goals: AAI



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

Main efforts:

- > 110'000 users (≈ 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.

Strategic Goals: Grid Middleware



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.

Strategic Goals: Virtual Organizations



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

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