6NET

Project Plan and Latest Update

Cisco Systems

What it is

- **A 3 year research project funded by the European Commission to prepare the Next Generation Internet.**

Main goals

- **To build and operate a dedicated international IPv6 network, and use this network to validate that the demands for the continuous growth of the global Internet can be met with the new IPv6 technology.**
- **To help European research and industry to play a leading role in defining the next generation of networking and application technologies that go beyond the current state of the art.**

Sub-objectives

- Operate an international pilot service such that geographically dispersed groups can interwork using native IPv6 facilities
- Validate the migration strategies for integrating IPv6 with the existing IPv4 infrastructure (core and access networks)
- Study and implement coexistence and migration techniques, and transition tools
- Introduce and intensively test state of the art IPv6 services

Sub-objectives cont.

- Test state of the art IPv6 applications and access to legacy IPv4 applications and content
- Evaluate the deployment and manageability of a large IPv6 network including physical infrastructure, address allocation, registries, routing and DNS operation
- Exploit the synergy between European NRNs and major industrial partners
- Collaborate with other IPv6 projects; offering the testbed for the support of their activities

Budget

- **Project cost: 17M €**
- **EC funding: 9,5M €**
- **Manpower: 1100 man months**

The opportunity

- **For Europe to lead the IPv6 (next generation) Internet**
- **Create new business environment → mobile Internet (?)**
- **Test and build new services and applications**
- **An IPv6 testbed for other IPv6 testbeds**

Industrial partners

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6net National Research Networks

DANTE

TERENA

GRNET
ΕΔΕΤ

NORDUnet

SWITCH
SWITCH

SURFnet

UKERNA

Renater

UNINETT

Forskningsnettet
The Danish Research Network
DTU

DFN
Deutsches Forschungsnetz

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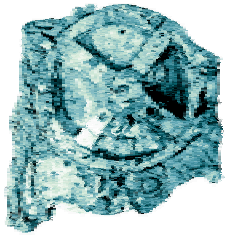
Universities

UNIVERSITÄT WIEN

ULB

Telematica
Instituut

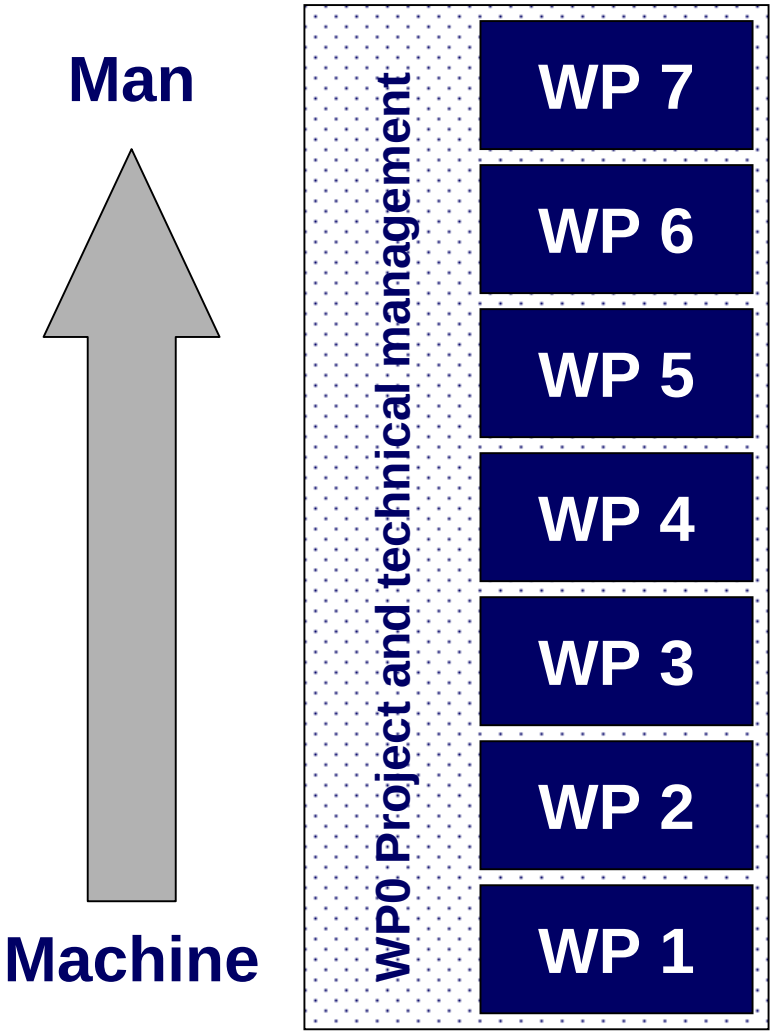


Research Academic Computer Technology Institute

Cisco Systems

Fraunhofer Institute for Open Communication Systems

Description of Work



Dissemination of information

Network management

Middleware and user applications

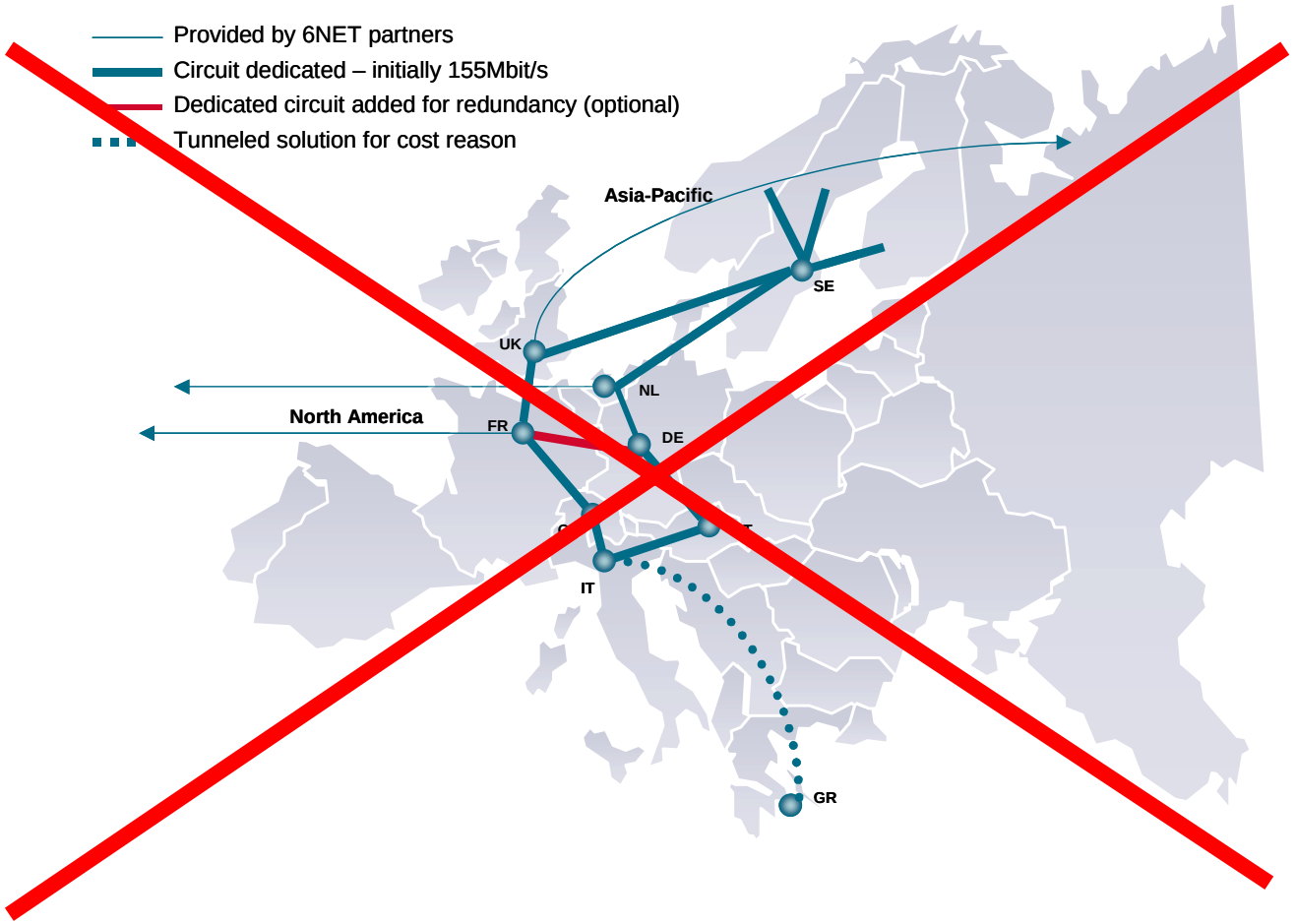
Application and service support

Basic network services

IPv4-IPv6 coexistence

Build and operate the IPv6 network

The initial 6net network



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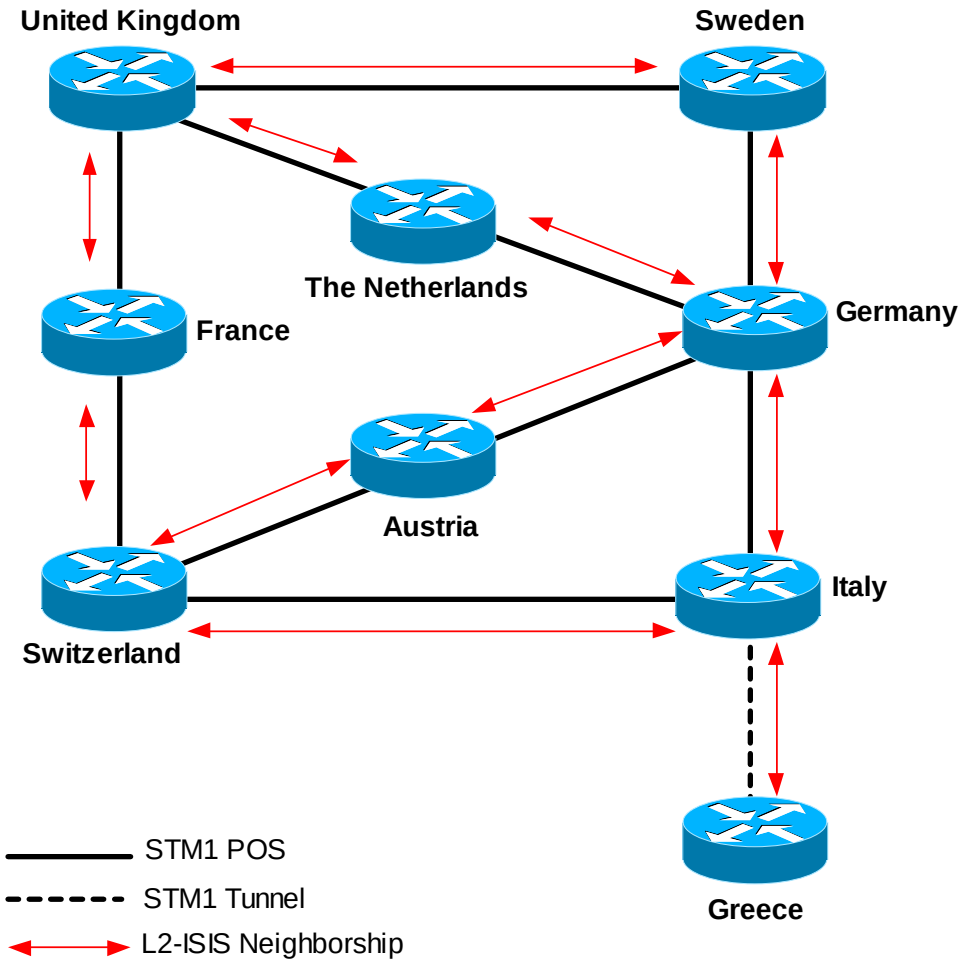
The actual 6net network



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Routing protocols

IGP:
I/ISIS with support for IPv6 - *draft-ietf-isis-ipv6-02.txt*
L2 neighborships only
ISIS Tuning:
LSP pacing, SPF and PRC back-off tuning

EGP:
mBGP with support for IPv6
AS# 6680 (will probably be changed)
iBGP full mesh between 6NET POP routers
eBGP towards the NREN POP routers
md5 neighborship authentication for iBGP and eBGP

Addressing

- 6NET available address space: 2001:0798::/40
- Each 6NET pop will get a /48
- Loopbacks get a prefix-length of /128
- Point-to-points a /64

Addressing

POP Location	IPv6 POP addressing: 2001:0798:<pop>::/48
Core:	2001:0798:0::/48
Sweden:	2001:0798:17::/48
Netherlands:	2001:0798:14::/48
Germany:	2001:0798:6::/48
Austria:	2001:0798:2::/48
Italy	2001:0798:12::/48
Switserland	2001:0798:4::/48
France:	2001:0798:8::/48
UK	2001:0798:20::/48
Greece:	2001:0798:9::/48

Equipment

- **Hardware**
  6net PoP: 12404
  NRN PoP: 12404 or 7206
- **Initial software**
  Cisco 12404: IOS 12.0(21)ST
  Cisco 7206: IOS 12.2(8)T