

IPv6 Testing Status Update

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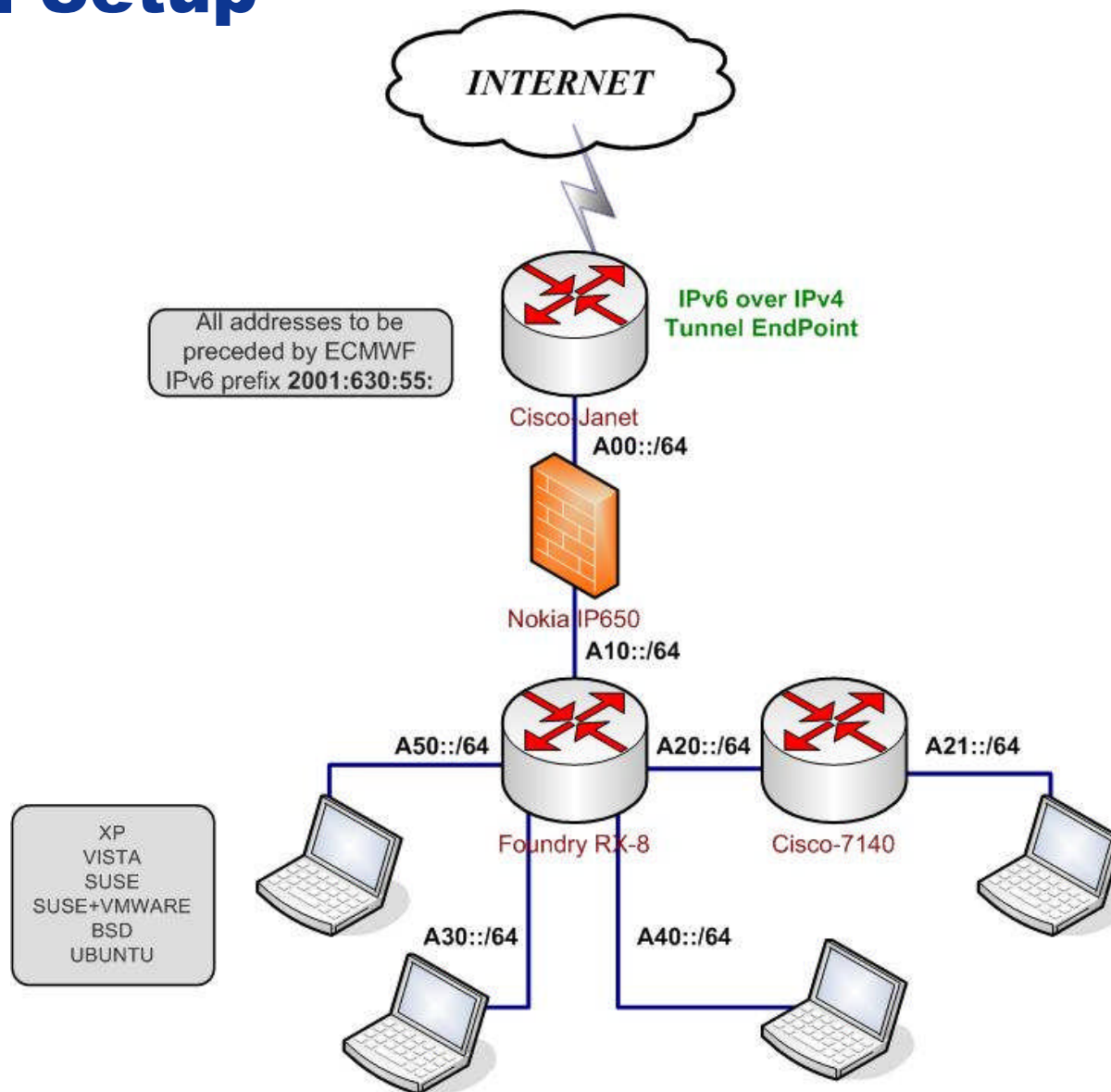
Network and Security Section

ECMWF

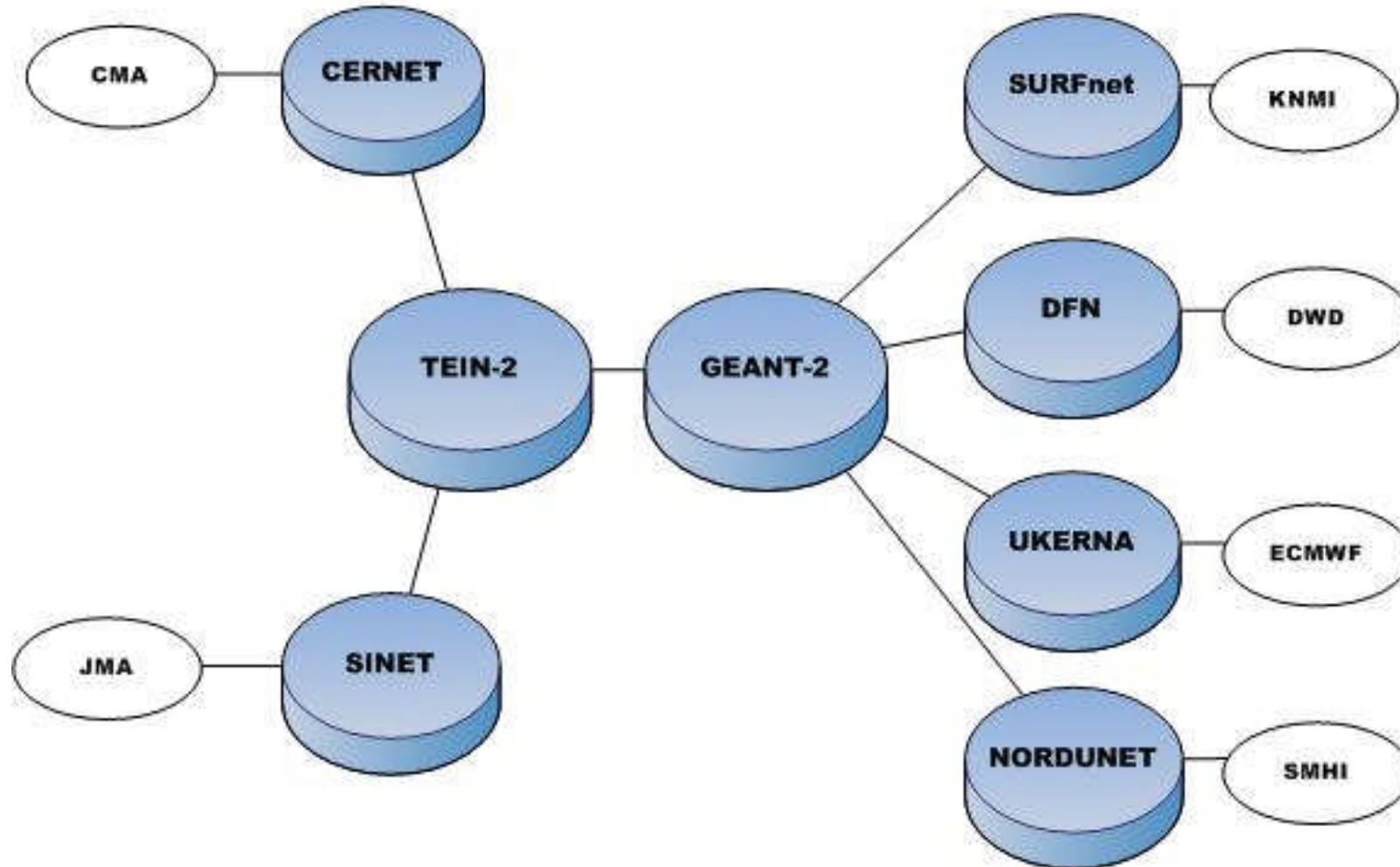
Objectives and partners

- To assess potential benefits and/or problems of deploying IPv6 in an operational environment.
- To assess IPv6 performance over existing infrastructure.
- Partners involved
 - CMA (China)
 - CNR (Italy)
 - DWD (Germany)
 - JMA (Japan)
 - KNMI (The Netherlands)
 - SMHI (Sweden)
 - ECMWF

Local Setup



Topology for external IPv6 tests



External Tests description

➤ Ping

- Record the round-trip time (RTT)

➤ Traceroute

- Record IPv6 path.

➤ Iperf and ftp

- Performance.

➤ HTTP and DNS

- Sites accessing an Apache web server at ECMWF.

Initial results (1)

- Only a few tests have been completed.
- Sites did not have any major IPv6 basic connectivity problems with ISPs.
 - *Some sites connected with Pure IPv6*
 - *Others connected using IPv6 over IPv4 tunnels.*
- Firewalls are ready.
 - *Setting up the rule set is more difficult as every host will have multiple addresses.*
 - *Performance on a recycled Nokia610 was not very good but may have been caused by running iperf on a relatively slow desktop.*
- Not all applications are IPv6 ready yet, but for the main services such as DNS, web and ftp there is no problem.

Initial results (2)

- Plug and play is nice ... but requires support staff to really understand IPv6 to solve problems.
 - ICMP6, neighbour discovery, router setup ...
- Performance to/from European sites seems to be similar to IPv4
 - Further tests are required.
- Performance to/from Asian countries seems a lot better
 - RTT to China is reduced by almost half
 - Iperf to JAPAN gave excellent results (>30Mbps).
 - Further tests are also required

Why is performance better ?

➤ Our initial guess is that

- New IPv6 infrastructure, specially across Research Networks such as GEANT2, is in place but not fully used yet.
- IPv6 routes may be more efficient than IPv4
 - Route from ECMWF to China is a textbook example

◆ JANET -> GEANT2 -> TEIN2 -> CERNET -> CMA

Situation with the providers and authorities

- **Most of the Internet provider are now IPv6 ready**
- **RMDCN Market Survey shown that MPLS Network Operator are IPv6 ready. The use seems quite minimal though**
- **EU has recently announced the funding of initiatives in order for IPv6 to represent 25% of the overall traffic exchanged in Europe**
- **OECD in a recent report:**

<http://www.oecd.org/dataoecd/7/1/40605942.pdf>

Is also urging towards IPv6 adoption.

What happens next at ECMWF

- Enable IPv6 operationally on some DMZ subnets.
- Enable IPv6 operationally on the main Firewalls.
- Modify ECMWF Dissemination transmission software (ECPDS) to be IPv6 capable (over the Internet).
- Modify ECACCESS to be IPv6 capable.

What will not happen ... yet

- Not planning to deploy on the LAN
- Not planning to migrate from IPv4 but rather to complement it with additional IPv6 services.