Main Objective:
Develop an advanced testbed for experiments and validation of an Advanced Terabit Router (ATR) : the A7770 RCP
Research, Design and experiment with a set of traffic management algorithms and protocols
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Objectives of the project

• Develop an advanced testbed for experiments and validation of an Advanced Terabit Router (ATR) : the A7770 RCP
  • WP1 : Installation and integration of the Network
  • WP2 : Conformance, Interoperability and Performance testing

• Research, Design and experiment with a set of traffic management algorithms and protocols
  • WP3 : Intra-domain traffic engineering, Use of QOS in MPLS, Resilience, Multicasting
  • WP4 : Inter domain traffic engineering

• Test the final version of the ATR with very high demanding applications
  • WP5 : Demonstration and Experiments

• Specify, Test and validate a NMS to operate and monitor IP QOS and MPLS enabled Core Networks
  • WP6 : IP Core Network Management Platform
ATRIUM network topology

Network active since June 2001

Nodes added August 2002

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Category: Optical Networks and Network Management
Testbed Configuration

**ATRIUM**: A testbed of Terabit IP routers running MPLS over DWDM

Category: Optical Networks and Network Management:: Transport Networks
Testbed: Cooperation with NRENs

ATRIUM: A testbed of Terabit IP routers running MPLS over DWDM
Category: Optical Networks and Network Management: Transport Networks
Stand-alone test: Conformance and Performance of the A7770 & interoperability with selected network components like Cisco 12000, Juniper M160, Riverstone

> QOS, MPLS-TE, BGP/IGP tests, forwarding tested by FT

> Multicast tested by Telefonica

> IPv6 & VPN planned for Q3
Traffic engineering

- Focus on traffic engineered E-LSPs
- Decentralized on-line algorithms
- Path computation at ingress nodes
  - On-demand, per E-LSP
  - Algorithms simulated
- Based on unreserved and/or unused bandwidth on links
  - Needs to advertise link states in a scalable way
  - Extensions to IGP proposed
  - Algorithms Simulated

- Partnership between the University and Alcatel
  - Detailed architecture study and impact analysis
  - Exchange of software of the impacted modules
  - Adaptation of existing interfaces
  - Integration and Testing using the core routers of the ATRIUM network
Integration of Optical networking in ATRIUM
Automated End-To-End Path setup (GMPLS Phase 1)

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Integration of Multimedia in ATRIUM

**Multicast Enabled Network**

- Multi-Games on-demand
- Video broadcast
- Music-Games on-demand
- E-learning
- Video server
- Webcam
- VoP equipment
- PC server
- PC client
- HDTV
- PC-client
- PC-client
- RS2000
- RS8000
- RS3000
- PASSPORT 8600
- JUNIPER MS
- CISCO 7200
- A7770 RCP
- TID
- A7770 RCP Paris
- BELNET
- Geant
- RedIris
- VTHD
- A7770 RCP Antwerp
- PSNC
- Cisco 7200
- Juniper M5
- Passport 8600

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Integration of Grid computing tests in ATRIUM

Throughput/latency in an
- Empty network
- Congested network using
  - Traffic engineered tunnels
  - Diffserv classification and scheduling
- Resilient network
Migration of Atrium towards IPv6

- Currently IPv6 Cloud peering with the IPv6NGNlab in Brussels.
- Atrium will be upgraded to a dual stack IPv4/IPv6 in September.
- Peering with VTHD and other IST IPv6 related projects.
- IPv6 applications.
Interop Tests

VideoLAN streaming experiment with Brussels Universities (ULB/VUB)

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