

ATRIUM

2/14/02

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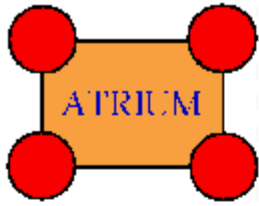
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Co-operation with SEQUIN



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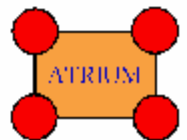
A testbed of terabit IP routers running MPLS over DWDM

SEQUIN workshop



Objectives of the projects

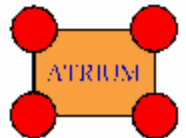
- **Develop an advanced testbed for experiments and validation of an Advanced Terabit Router (ATR) : the A7770 RCP**
 - WP1 : Installation and integration of the Network
 - WP2 : Conformance , Interoperability and Performance testing
- **Research, Design and experiment with a set of traffic management algorithms and protocols**
 - WP3 : Intra-domain traffic engineering, use of QOS in LSP, multicasting, use of MPLS resilience
 - WP4 : Inter domain traffic engineering, impact on BGP and RSVP-TE
- **Test the final version of the ATR with very high demanding applications**
 - Wp5 : Demonstration and Experiments





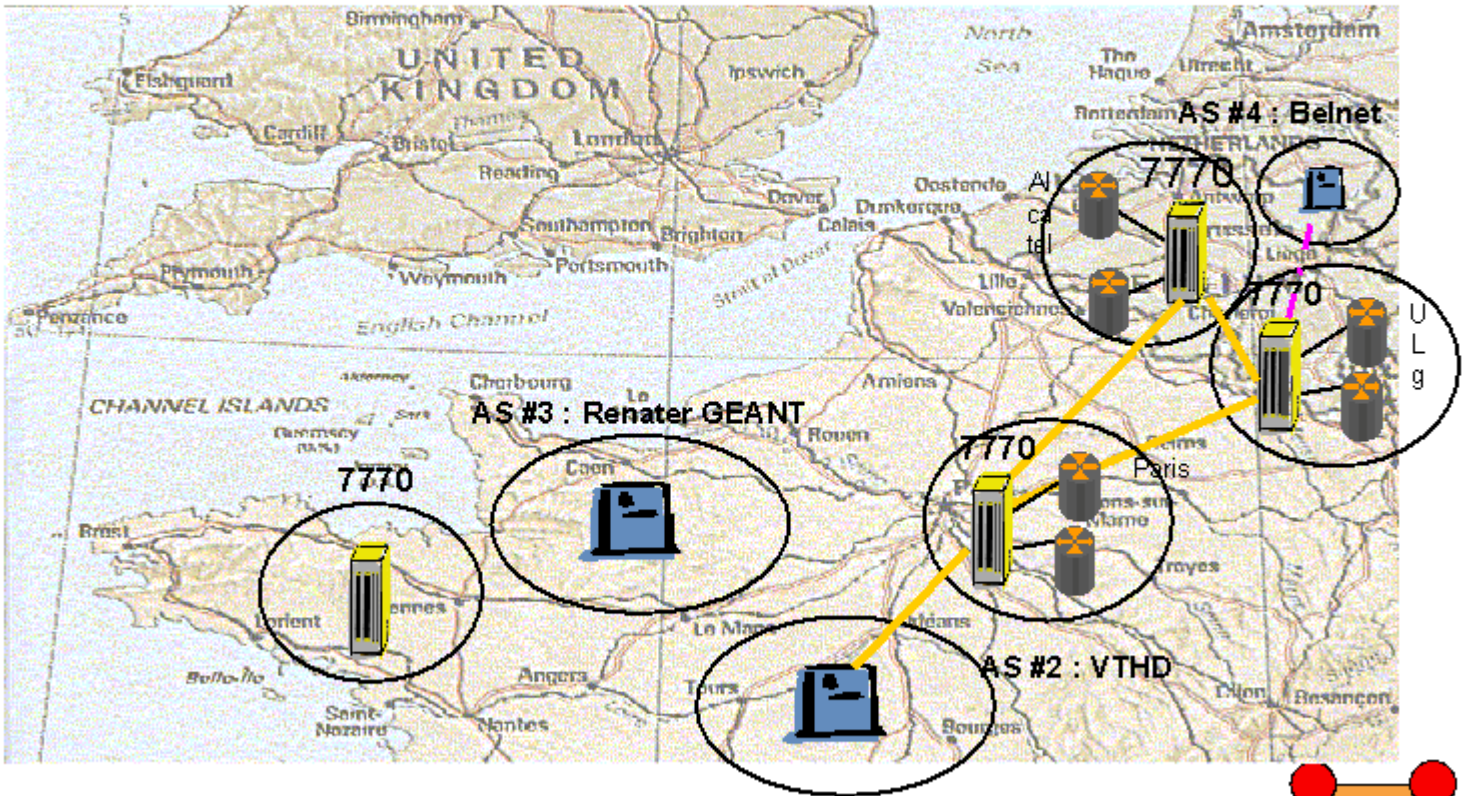
Partners and contributions

Partner	Major Focal Points
Alcatel	<i>Equipment (ATR routers)</i> <i>Installation</i> <i>Testing</i> <i>Coordination</i> <i>Demonstration</i>
FTR&D – France Telecom Mobistar	<i>Network installation and maintenance</i> <i>Testing</i> <i>Research</i> <i>Demonstration</i>
Universite de Liege	<i>Installation</i> <i>Research</i> <i>Testing</i> <i>Demonstration</i>
Faculte Universitaires Notre Dame de la Paix Namur	<i>Research</i> <i>Testing</i> <i>Demonstration</i>



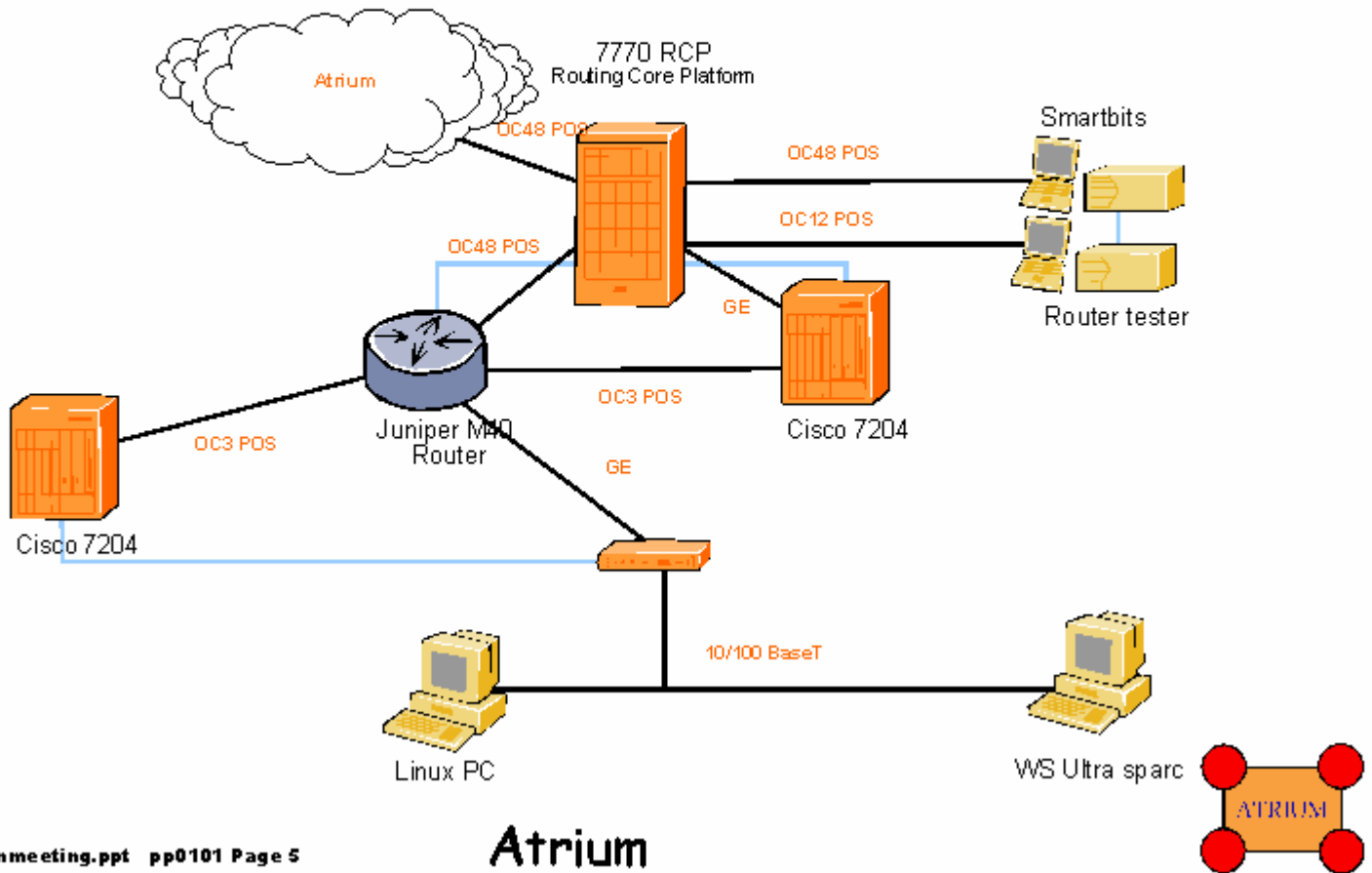


WP 1 Network : End of the year 2001





Antwerp Local configuration: layout





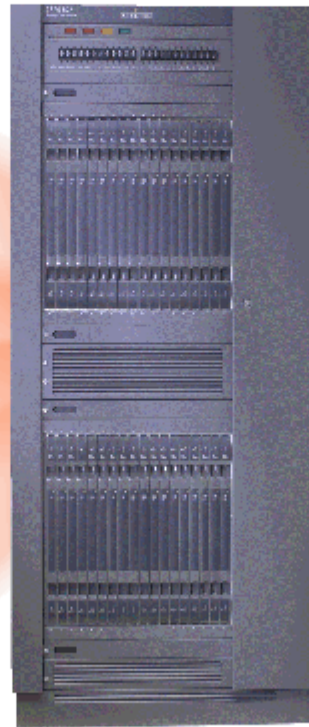
A7770 : Design and architecture

Alcatel 7770 RCP:
Designed to Excel in New Generation IP Networks

High Performance
and Scalability

Non-Stop
Networking

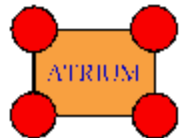
Guaranteed
Service Level
Agreements



Easy and Effective
Management

Optical IP
Internetworking

Atrium

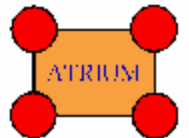




Guaranteed Service Level Agreements

Working modes of the Alcatel 7770 RCP

- In non-DiffServ networks:
 - Non-DiffServ BE
 - Two queues are used: IP/MPLS and IP control traffic
 - Non-DiffServ BBE
 - Three queues are used: IP, MPLS and IP control traffic
- In DiffServ enabled networks:
 - DiffServ IP
 - Twelve queues are defined: AF1-4, BE, EF, control traffic
 - DiffServ IP/MPLS
 - Same as DiffServ IP, but for MPLS the EXP bits are interpreted
- Scheduler is based on
 - Weighted Fair Queuing
 - Strict Priority Queuing (for EF traffic) -> available in April 02

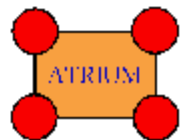
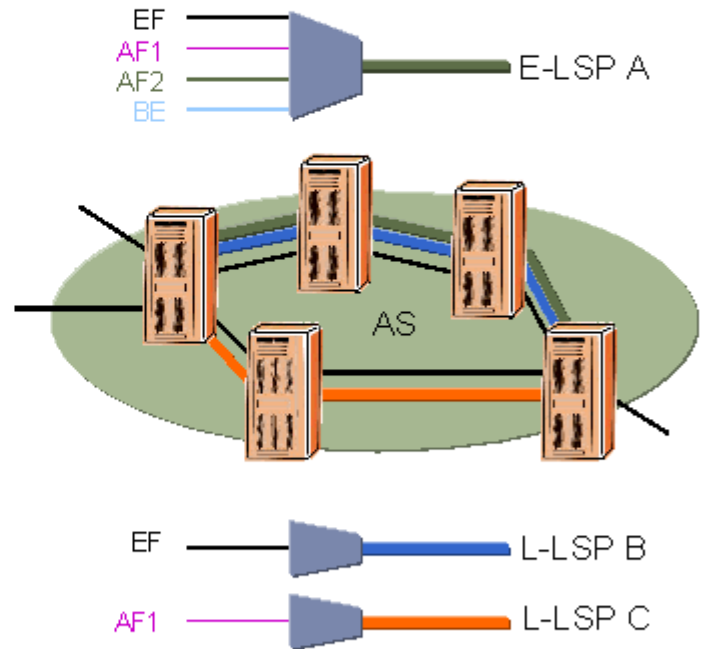




Guaranteed Service Level Agreements

Powerful DiffServ Implementation

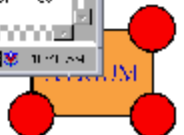
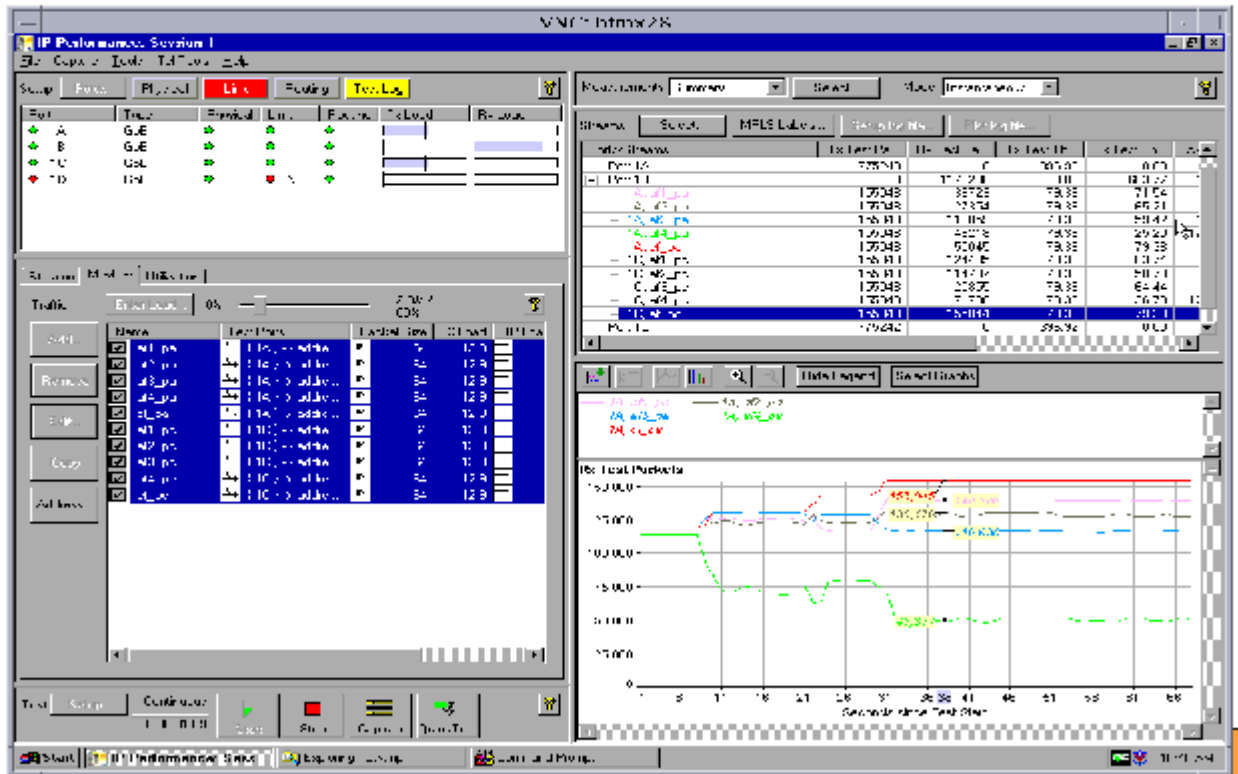
- E-LSP (EXP-bit inferred LSP)
 - multi QoS LSP with or without bandwidth reservation
 - carries up to eight Behavior Aggregates
 - EXP field encodes DSCP
 - **Pro:** less LSPs
 - **Con:** more complex network design
- L-LSP (Label inferred LSP)
 - single QoS LSP with or without bandwidth reservation
 - EXP field encodes Drop Precedence
 - **Pro:** simpler network design
 - **Con:** more LSPs





WP2 : Conformance , Interoperability and Performance testing

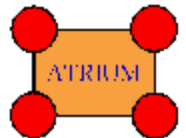
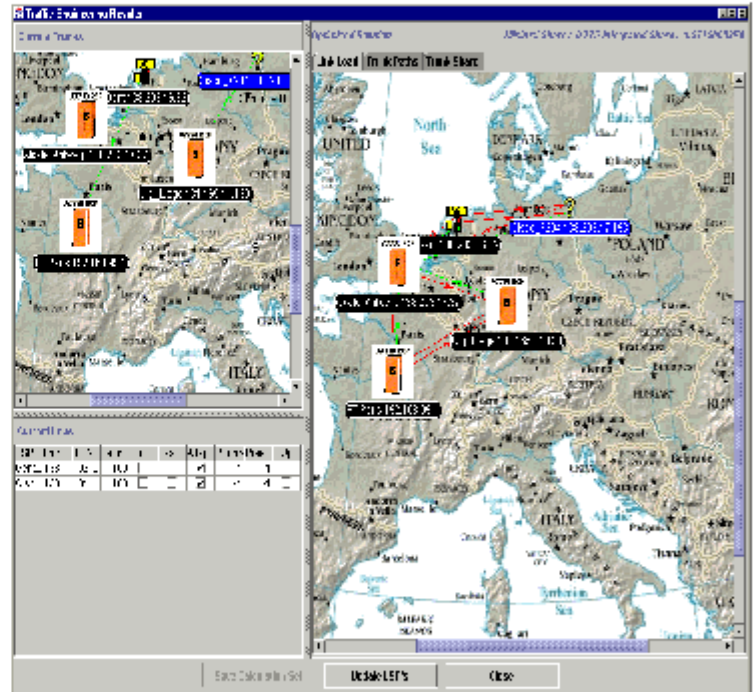
E-LSP, DiffServ QOS tests ongoing

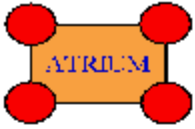




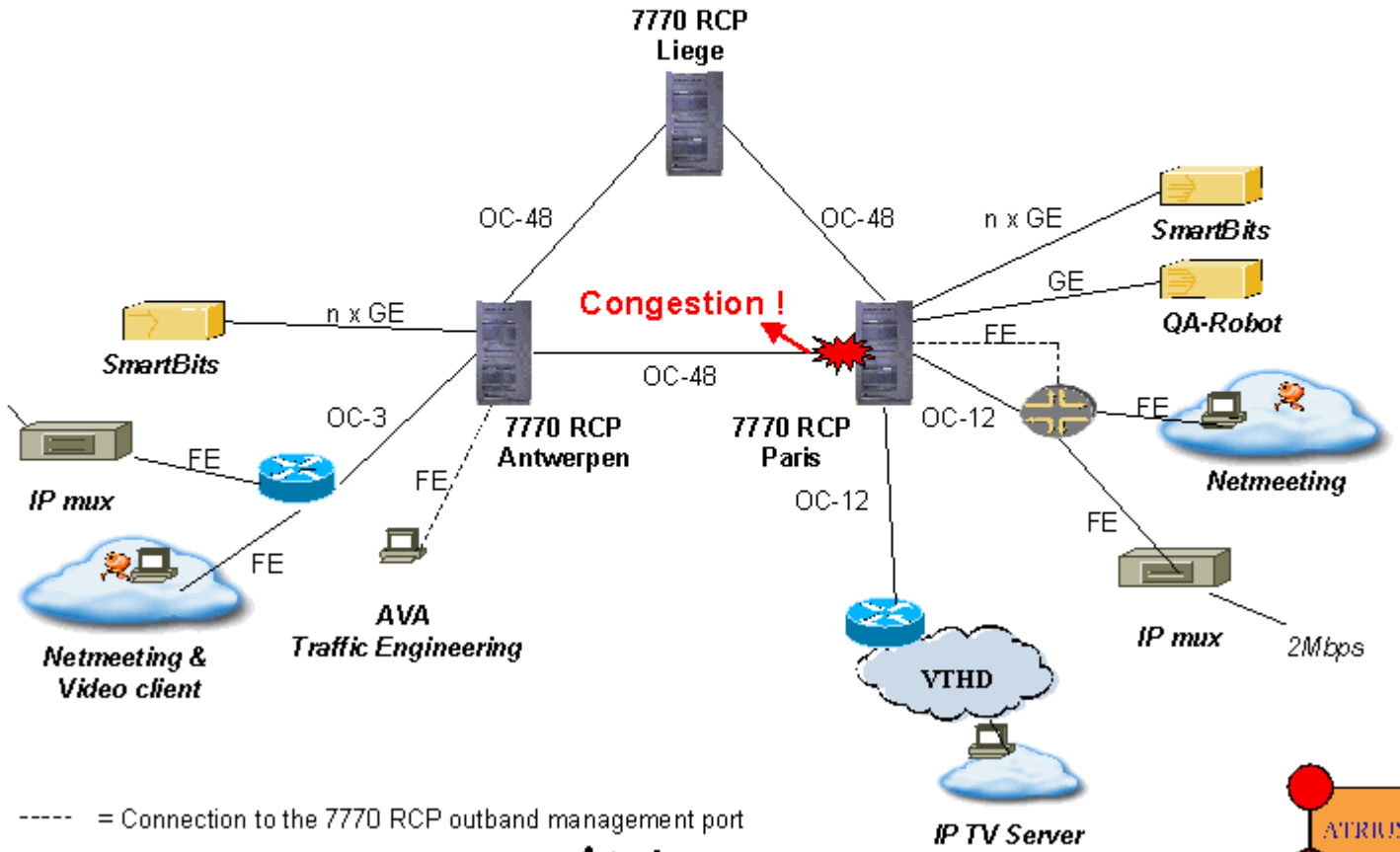
WP2 : Traffic Engineering Platform tests

- Off line Traffic Engineering
- Discovery of network
- Visualization of
 - network
 - Routers and interfaces
 - capacity
 - LSPs
 - primary
 - backup LSPs



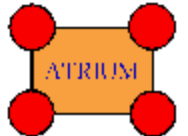


WP5: Experiments



sequinmeeting.ppt pp0101 Page 11

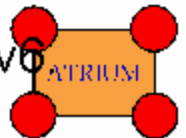
Atrium





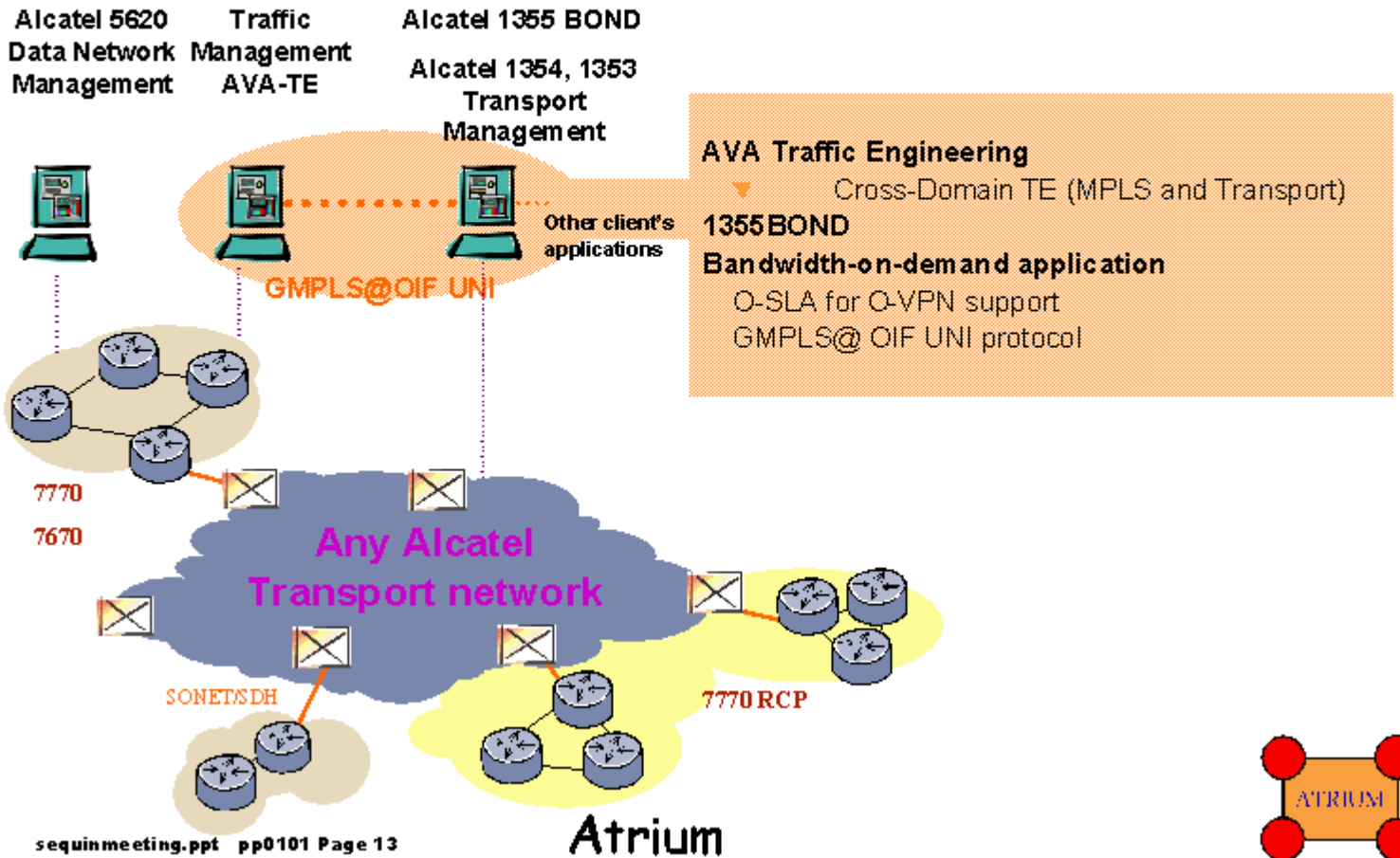
Extra focus on

- Workshop for TF-NGN and IST members in April
- Extension to Poland, Barcelona and Italy (Moicane) under discussion, interconnected via VTHD, Atrium or via GEANT
- Tests with 10 Gb on interconnections in June
- QOS : ATM-IP mediation using MPLS-TE
 - Interconnect A7670 to A7770
- OPTIP : Include OPTIP program into Atrium
 - Experiments
 - Technology
- IPv6 : Upgrade A7770 by end 2002 and demonstrate IPv6





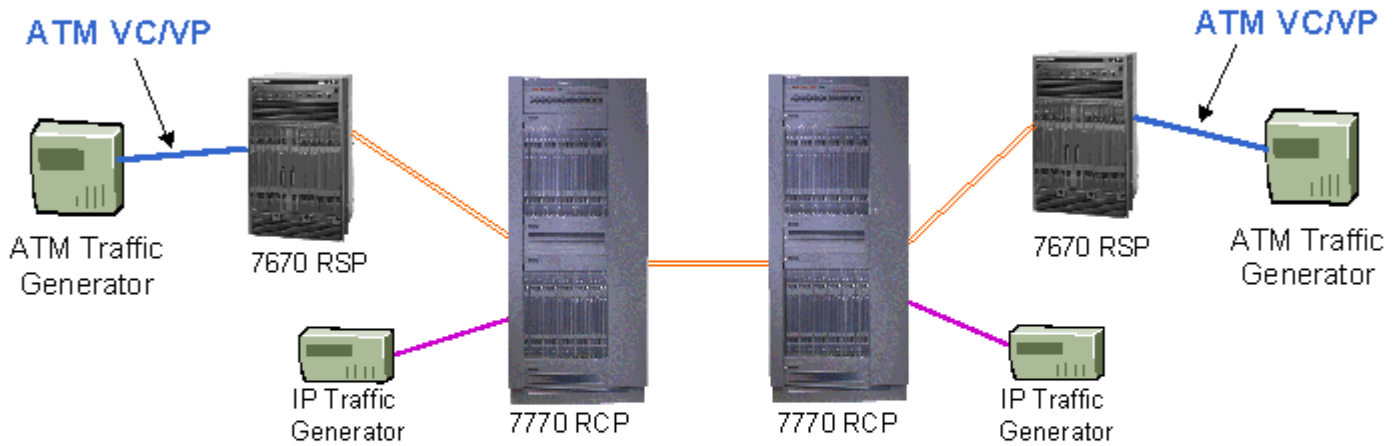
Core Node 1: Network Dynamic through Management



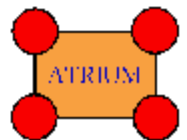
sequinmeeting.ppt pp0101 Page 13



QoS for Mediated Traffic



- Mediation of ATM traffic over a pure IP/MPLS core.
- Overload IP/MPLS Core with BE IP traffic.
- Show that mediated ATM traffic is not impacted.





Co-operation with SEQUIN

- Set the test bed available to the Sequin group
 - All DSCPs and associated queues are available
 - Testbed can be loaded, links can be disabled/interrupted
 - Configure the routers to allow
 - ▣ Premium service
 - ▣ BE Set the testbed under load conditions
 - ▣ Scavenger service ?
 - ▣ AF classes ?
 - measure
 - ▣ Delay
 - ▣ Loss
 - ▣ Delay Variation
 - Via a local workshop or via the interconnection with GEANT

