R&D Centre ALGORITMI University of Minho

PRAXIS XXI/98 Project - QoS II: Quality of Service in Computer Communication Systems

Objectives and contributions:

Proposal and evaluation of **algorithms**, **mechanisms** and **protocols** to empower communication systems with QoS capabilities:

- ⇨ Application services to QoS requirements mappings
- ⇨ QoS monitoring and management in distributed environments
- ⇨ QoS routing
- ⇨ QoS to Class of Service (CoS) conversion

Mapping application services into QoS requirements:

- Specification of traffic characteristics and QoS requirements
- Service contract establishment
- Support for multicast flows
- QoS adaptation
- Cost policies accordingly to QoS levels
- Security mechanisms
- Synchronisation of related flows

⇨ Mapping between applications requirements, IP services and ATM using RSVP, MPLS and AREQUIPA
⇨ Session issues on QoS provision to multimedia CSCW applications

QoS management in distributed environments:

- Gathering information on communication system's provided QoS
- Different QoS characteristics to be integrated into a single metric (bandwidth, delay, jitter)
- Fundamentals for QoS management functions, service contract set up and flow policing
- Analysis of the relations between specified QoS, reserved resources and obtained QoS

⇨ Experimentation and evaluation of the UC-QoS metric in the Differentiated and Integrated Services architecture
⇨ Management requirements for QoS establishment and policing

QoS routing:

- Current routing paradigms use shortest-path algorithms, minimising just a single metric parameter
- Within communication networks offering QoS-based services, routing decisions must take into account QoS requirements and availability of resources within the network, leading to the need for signalling mechanisms
- Path selection, satisfying several constraints, is an NP-complete problem. QoS routing should overcome this situation in a scalable way

⇨ Experimental testing of ATM PNNI
⇨ Simulation study of QoS routing protocols protocols (QOSPF, PQC) integrated with RSVP

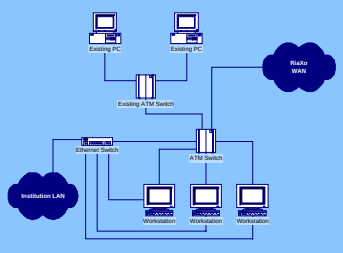
QoS to CoS conversion:

- QoS approaches: suitable for edge networks allowing for mappings between application needs and QoS requirements; pricing and policing mechanisms should be established
- CoS approaches: suitable for core networks where flows are aggregated in classes. Classes and correct dimensioning of network resources, may provide end-to-end QoS
- Coexistence of both approaches requires mechanisms for mutual conversions

⇨ Simulation study: Mapping between QoS and CoS - RSVP/IntServ in the edge network and Differentiated Services in the core network; End-to-end Integrated Services over core networks with Differentiated Services

Project environment:

Two Local Area Network testbeds (CISUC and CCG-UM/Algoritmi) interconnected by means of an ATM Wide Area Network (RiaXo)



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