



JANET QoS Development

Jeremy Sharp, UKERNA

J.Sharp@ukerna.ac.uk

Agenda

- ◆ Background
- ◆ JANET QoS overview
 - Proposed policy framework
 - Proposed technical framework
- ◆ JANET QoS development project
- ◆ Expressions of interest

Background

- ◆ SuperJANET4 Development Programme
 - internet trends
 - increasing bandwidth is not the sole answer
 - recognition of the need for more than just BE
- ◆ JANET QoS Think Tank
 - requirement for QoS on JANET
 - policy framework
 - technical framework

Proposed QoS Classes

QoS Class Name	Description
Less than Best Efforts (LBE)	The aim of this service is to give a better quality of service for more important data by channeling lower priority, non-critical traffic into a less than best efforts class.
Best Efforts	This is the service that we currently use on JANET.
IP +	For support of service such as streaming video and interactive applications – this is based upon DiffServ Assured Forwarding (AF).
IP Premium	For time-sensitive applications, such as videoconferencing and Voice over IP – this is based upon DiffServ Expedited Forwarding (EF).

Policy Framework (1)

◆ Provisioning

- Premium service 5% (max)
- IP+ 5% (max)
- Best efforts 89% (min)
- Less than best efforts 1% (min)

◆ Service Level Specifications

Policy Framework (2)

- ◆ Interdomain working
- ◆ Authentication, Authorization and Trust
- ◆ Policing
 - Each domain policies on ingress
- ◆ Service monitoring

Technical Framework (1)

- ◆ Differentiated Services to be used
- ◆ QoS techniques:
 - classification
 - marking
 - rate measurement
 - traffic shaping
 - policing
 - congestion control
 - Queuing and scheduling

Technical Framework (2)

- ◆ Network control traffic
- ◆ Behaviour of the QoS model
 - Protect IP Premium upto provisioned level
 - Protect characteristics of IP+ upto provisioned level
 - Prevent starvation of BE and LBE
 - Process out-of-contract traffic (drop or re-mark)
- ◆ Congestion and packet loss

QoS Functions

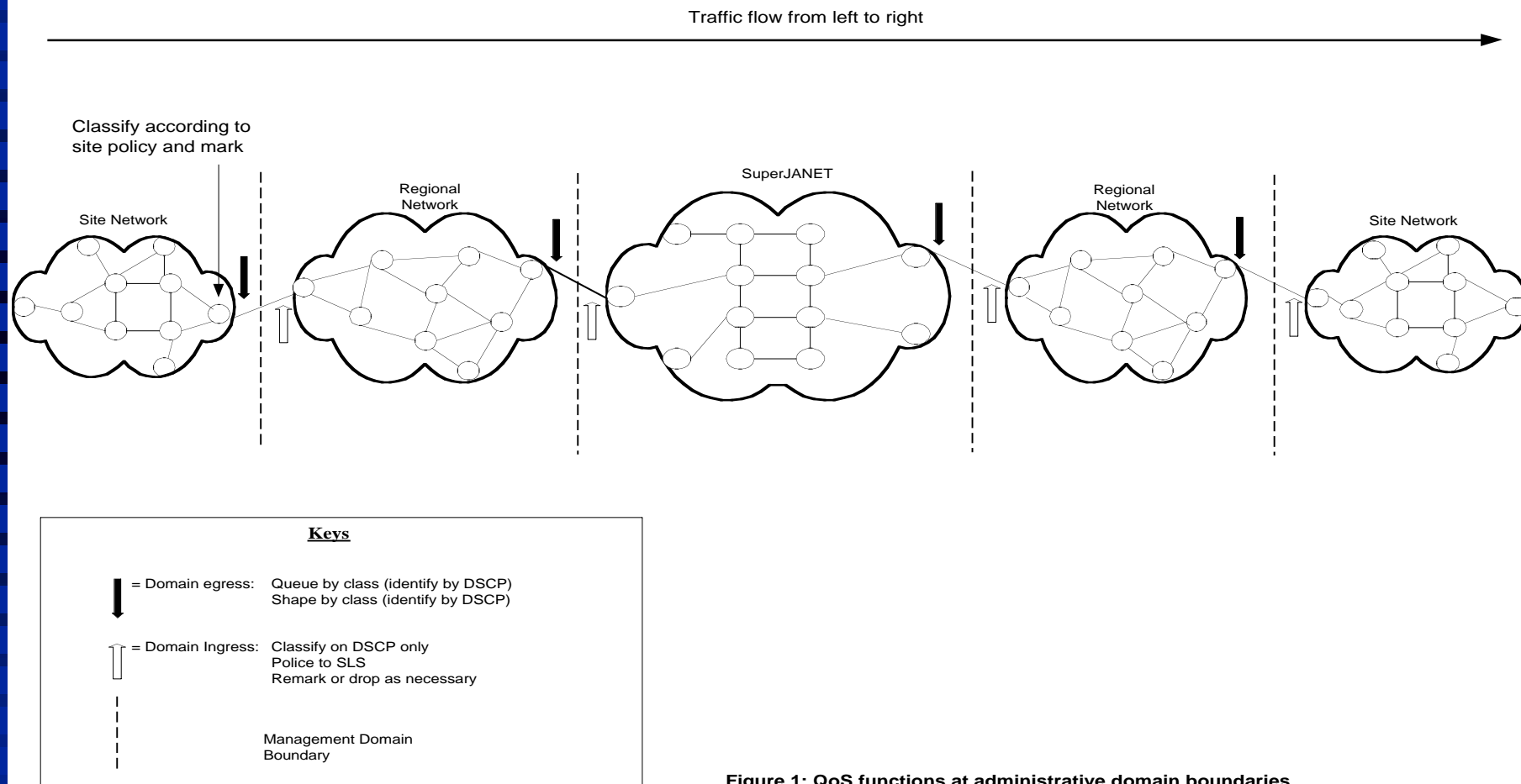


Figure 1: QoS functions at administrative domain boundaries

Implementing QoS

All Routers	Configure queues for the traffic classes
	Configure queue scheduling (MDRR)
	Configure congestion thresholds for each queue
SuperJANET Backbone	As for regional network

Implementing QoS

Regional Networks, Edge, Ingress	Classify packets on DSCP mark
	Police to SLS, dropping or re-marking out-of-contract or illegal traffic
	Allocate packets to a queue appropriate to the class
Regional Networks, Edge, Egress	Classify packets on DSCP mark
	Allocate packets to a queue appropriate to the class
	Apply shaping to each class to conform to the appropriate SLS
Regional Networks, Internal	Classify packets on DSCP mark
	Allocate packets to a queue appropriate to the class

Implementing QoS

JANET Sites, Outbound	Classify traffic according to local policy and allocate to a traffic class
	Mark packets according to the class chosen
	Allocate packets to a queue appropriate to the class
	Apply shaping to each class to conform to the SLS with the Regional Network
JANET Sites, Inbound	Classify packets on DSCP mark
	Police to SLS, dropping or re-marking out-of-contract or illegal traffic
	Allocate packets to a queue appropriate to the class

JANET QoS Development Project - Aims

1. Define an Open and non-proprietary framework for QoS services
 - A policy framework
 - A technical framework (set of classes, inc. SLS's)
2. Prototype the QoS framework & assess whether it works
3. Determine the manageability of the proposed QoS services
4. Determine next steps of JANET QoS services deployment & prepare detailed plans.

JANET QoS Development Project - Scope

- ◆ IP Premium & LBE to be prototyped initially
- ◆ Involvement in the project is open to all JANET Primary connected organisations, in collaboration with their Regional Networks
- ◆ Organisations should 'bring an application'

JANET QoS Development Project – Criteria for Participation

- ◆ Participation of organisations and regional networks
- ◆ Flexibility
- ◆ Applications as a driver
- ◆ End-to-end scope

Timescales

- ◆ Expressions of Interest sought
- ◆ Expressions of Interest close – Monday 22nd April 2002
- ◆ Workshop with those that have responded to the EoI on 1 May 2002
- ◆ 8 to 12 month pilot envisaged

Funding

- ◆ Total budget of £500k (ex VAT)
 - Minor upgrades to existing network infrastructures
 - SuperJANET core infrastructure
 - Monitoring
 - Contribution to effort