

JANET QoS Development project completion

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Agenda

- Phase 1 objectives and results
- Phase 2 objectives and results
- Why QoS won't be a production service on JANET in short-term perspective
- Case-by-case approach: examples
- Guidance documents
 - Policy Framework
 - DSCP Marching Scheme
 - Technical guide

Phase 1 (2002 – 2004): Objectives

- To gain practical experience in the QoS area by carrying out JANET-wide tests
- To look at QoS-wise benefits for some popular JANET applications (VC, VOIP, bulk data transfer)

Phase1: Results

- QoS benefits were noticeable, basic mechanisms worked!
 - In most cases both VC and VoIP traffic benefited from IP Premium service when Best Effort traffic experienced delays and loss
 - LBE unicast traffic received allocated percent of bandwidth during BE bursts and didn't affect Best Effort and IP Premium

Phase1: Results

Provisioning issues remained open:

- How to maintain an access to privileged bandwidth within core and Regional Networks?
- How many QoS classes to support ?
- How much privileged bandwidth to reserve?
- Static or dynamic provisioning?

Phase 2 (2002 – 2004): Objectives

- To investigate a possibility of deploying a production QoS service on JANET
- Both provisioning and technical (e.g. multicast QoS) areas had to be addressed
- Applications benefiting from QoS – further investigation

Phase 2 trials

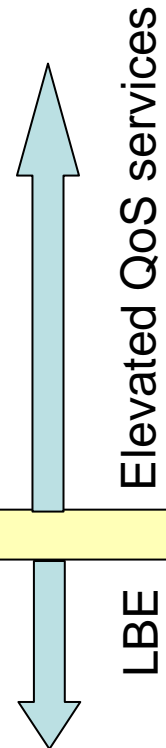
Several trials had been carried out :

- JVCS (JANET Video Conference Service)
- Multicast streaming (BBC streams plus JANET-based sources)
- QoS on schools' radio and DSL links (CLEO)

Best Effort applications: email, static web,

- Mirror service in Kentish MAN

Findings are described in the deliverables published on the JANET(UK) web site



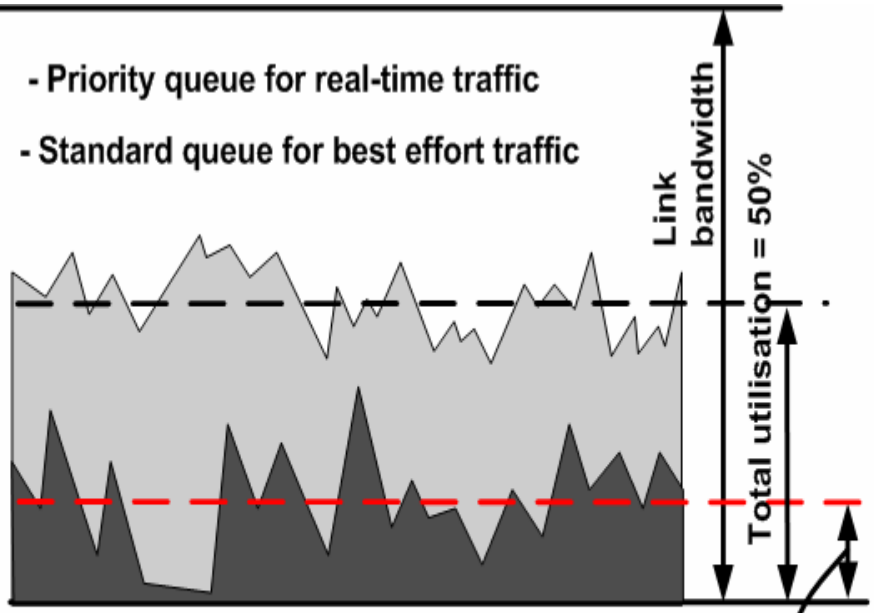
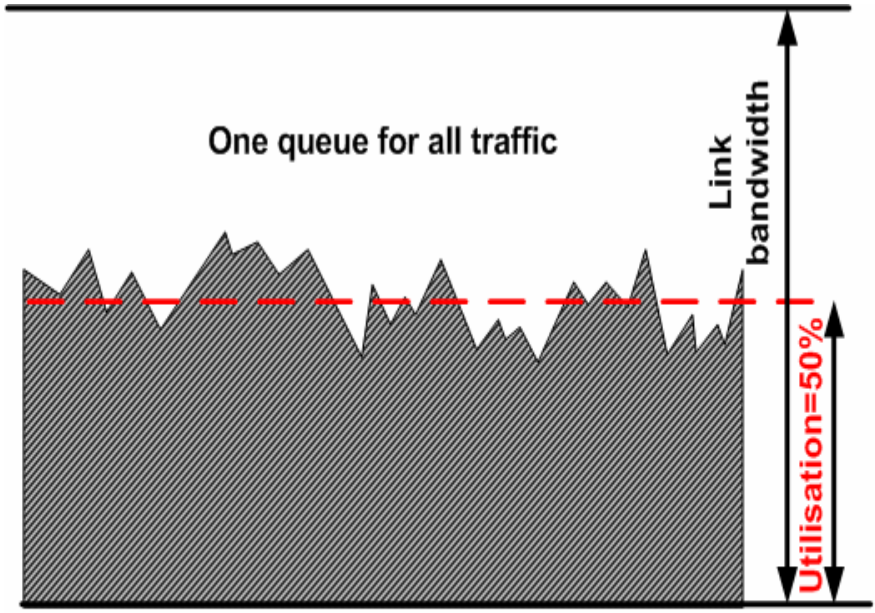
Phase 2 results

- Production QoS services will not be provided across JANET in the near future (difficult decision)
- Well-provisioned JANET core will be QoS neutral (transparent for QoS marking)
- Regional Network Operators are recommended to deploy QoS on a case-by-case basis on access links
- Guidance documents are developed and published

Reasoning of the decision

- Over-provisioning JANET core and many RNs cores
- Slow progress in QoS standardization
(IntServ, DiffServ – almost haven't changed since late 90s)
- Low demand for QoS within JANET community
(March 2007 survey results)
- Lack of positive third-party experience (commercial, Internet2, GEANT2, NRENs)

QoS vs. Over-provisioning



█ - mix of real-time and elastic traffic

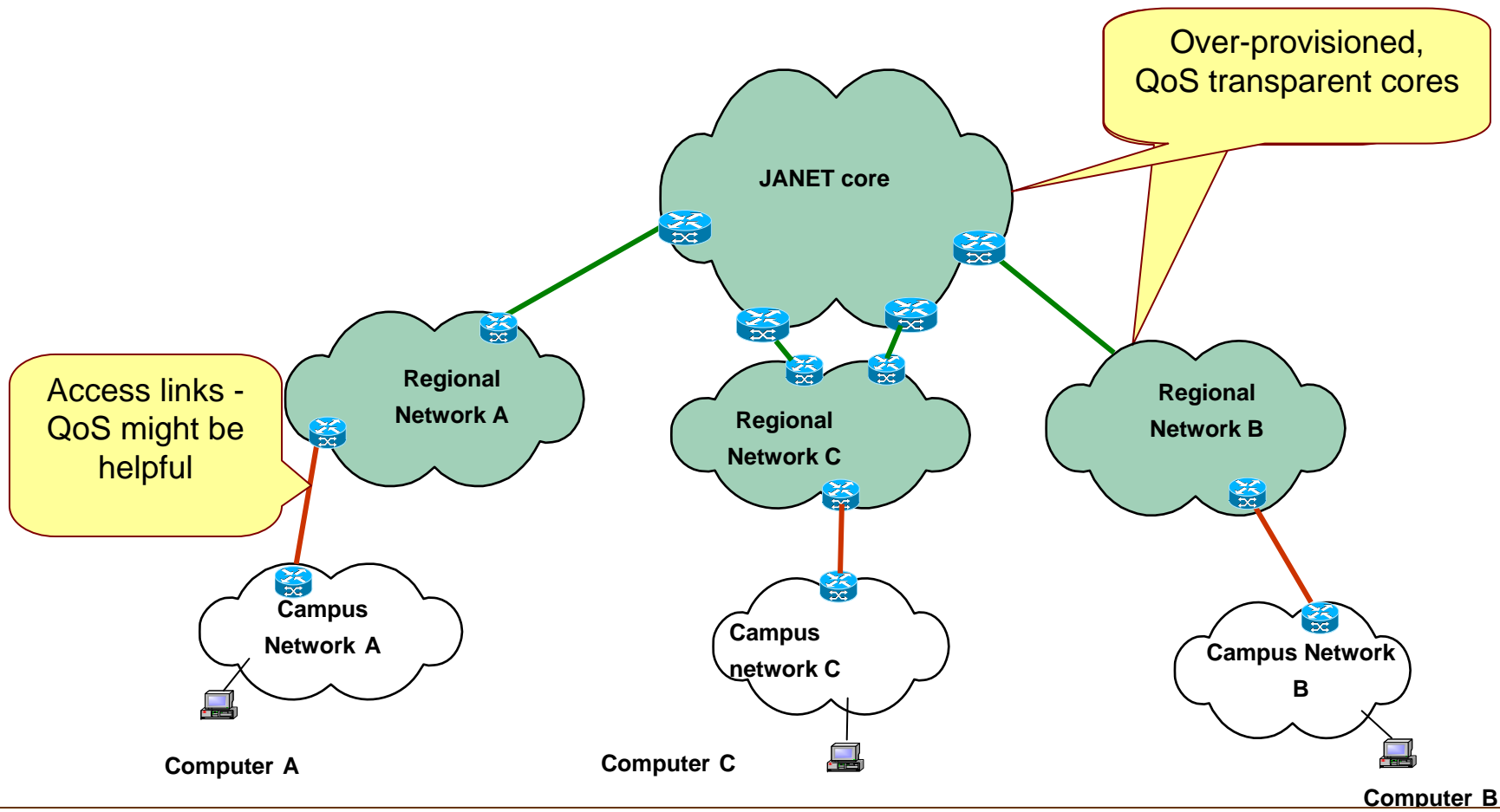
█ - best effort traffic
█ - real-time traffic

Utilisation by real-time traffic = 15%

a) all traffic is served by one queue

b) real-time traffic is served by a priority queue

JANET QoS model

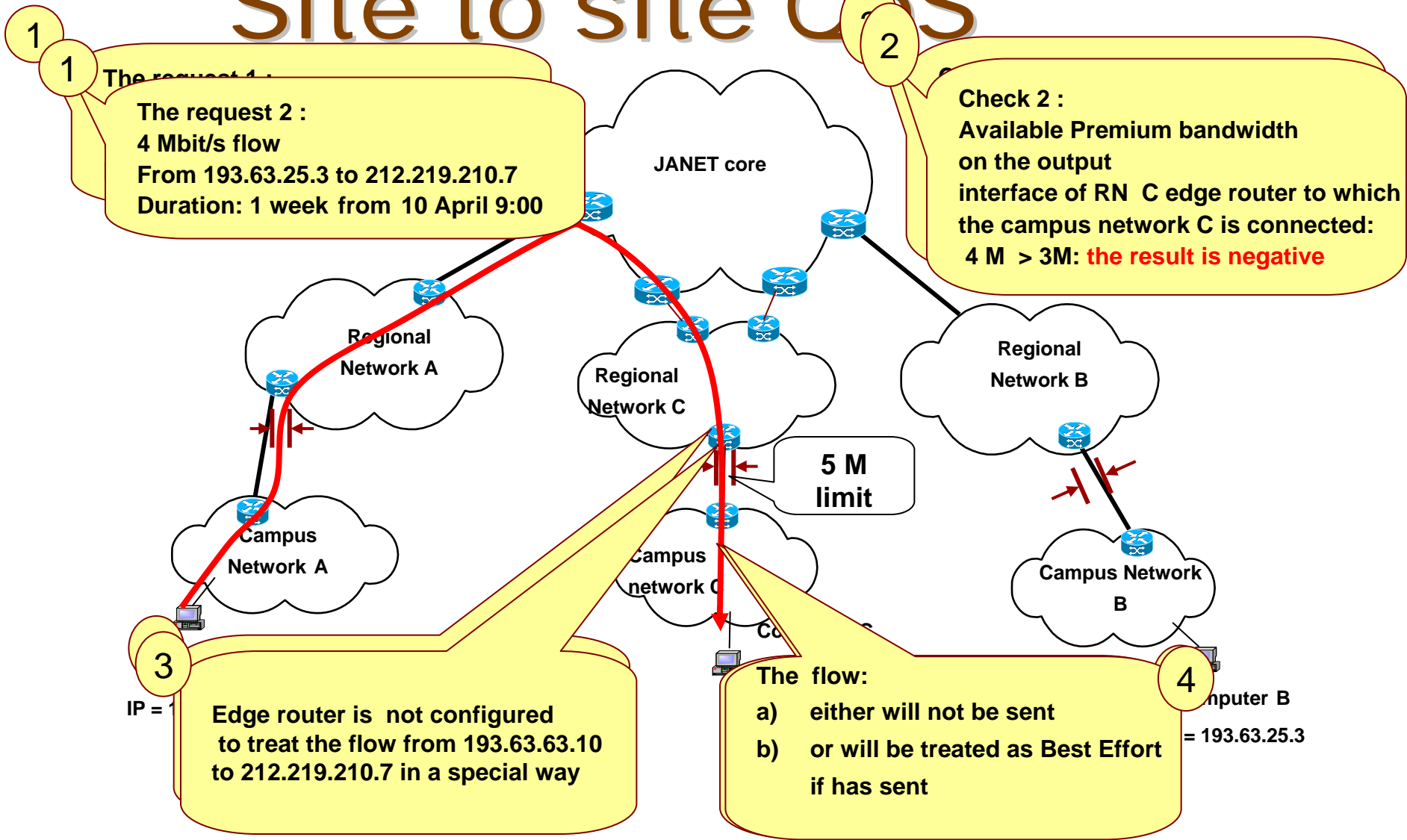


The Model is a good compromise between demands and efforts

The model benefits

- QoS is deployed only where and when it is really needed:
 - customer-triggered process
- Well-provisioned JANET core and RN cores will remain QoS transparent:
 - no additional configuration
 - needs planned capacity upgrades to keep up with traffic growth
- Sites can deploy QoS on their own way

Example 1: Site to site QoS



1
1
The request 1:
The request 2 :
4 Mbit/s flow
From 193.63.25.3 to 212.219.210.7
Duration: 1 week from 10 April 9:00

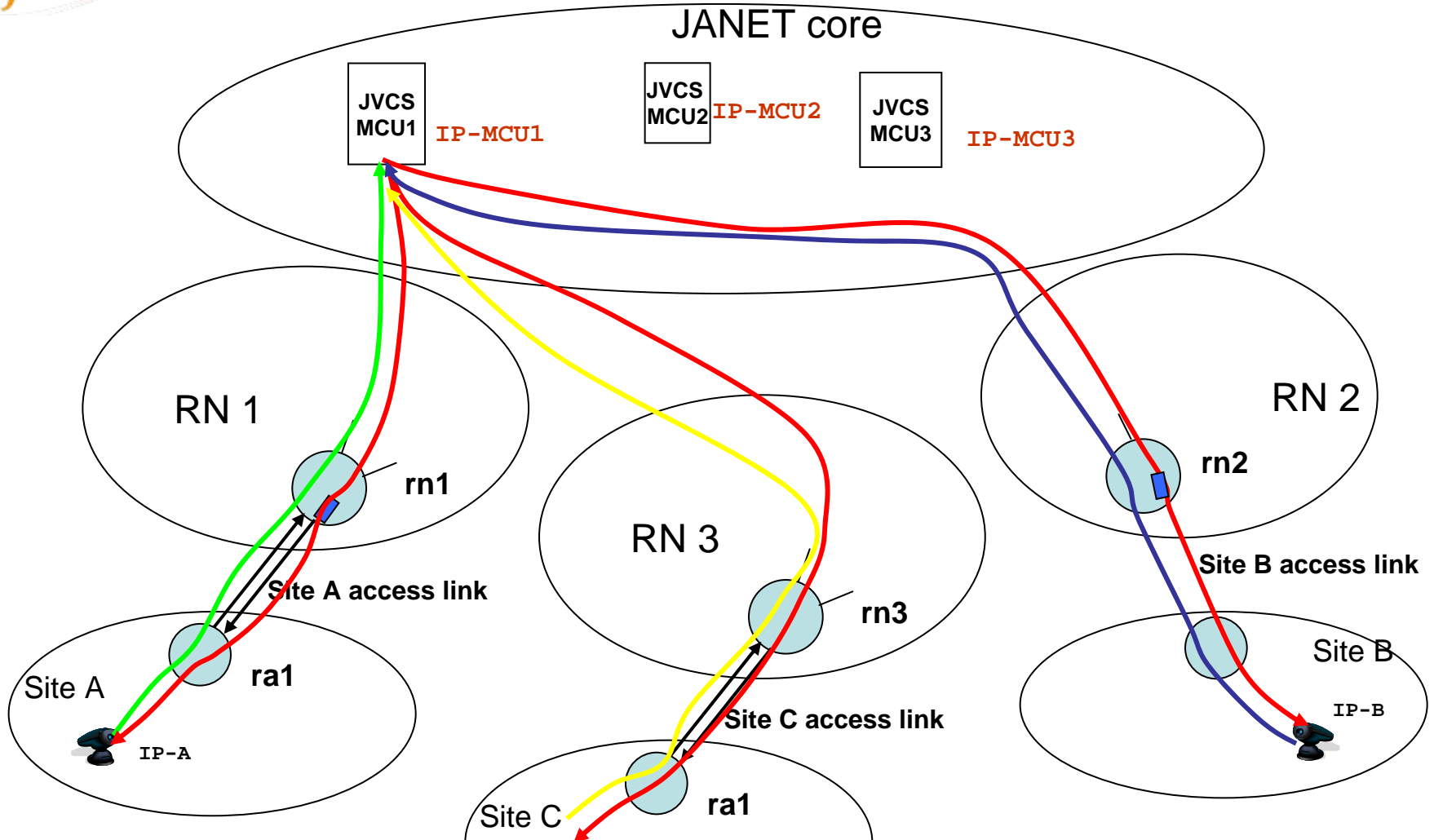
2
Check 2 :
Available Premium bandwidth
on the output
interface of RN C edge router to which
the campus network C is connected:
4 M > 3M: **the result is negative**

3
Edge router is not configured
to treat the flow from 193.63.63.10
to 212.219.210.7 in a special way

The flow:
a) either will not be sent
b) or will be treated as Best Effort
if has sent

4
Computer B
IP = 193.63.25.3

Example 2: QoS for JVCS



Completely static configuration; the reserved bandwidth is available when no VC

Guidance documentation

- JANET QoS Policy framework
- JANET QoS Suggested DSCP Marking Scheme
- JANET QoS Technical Guide

Further information:

<http://www.ja.net/development/qos/index.html>

Questions ?

Explored window of QoS benefits

