

QBone Scavenger Service (QBSS)

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What?

QBone Scavenger Service (QBSS) creates an additional class of network service. Its overall goal is to allow one to increase link utilization (to the point of saturation) without having an impact on performance of the default class of service. QBSS can be thought of as running on a parallel virtual network that has very scarce capacity, but which can expand into capacity of the default service, if the latter isn't all used. To identify traffic belonging to the QBSS class, a special differentiated services code-point (binary 001000) is designated. Packets bearing this QBSS code-point are eligible for QBSS; they can be considered carrying a hint to the network that they can receive downgraded service.

Why?

- Deployment of QPS stalled; need to move forward.
- Routers have unused features (WFQ/WRR/MDRR/CBR).
- We can get something for almost nothing.

While QBSS is less valuable than QPS, it still has value, and we can actually deploy it *today*.

Who?

Traffic is marked for QBSS primarily voluntarily. Such applications as bulk data transfers (lasting for hours and days), network backups, stable content (such as software) distribution and mirroring could benefit from this service. It is hoped that availability of this service will prompt creation of new kinds of distributed applications that can take advantage of idle network capacity in the same way distributed computations take advantage of idle CPU cycles. QBSS can have policy implications, which are left for individual participating domains to consider.

HOW?

The minimal requirement for a participating domain is to pass the QBSS code-point, and simply treat QBSS and default classes identically. This allows for incremental deployment of service where it matters—on ends of heavily loaded network circuits. This also has an advantageous effect: right from the start, there will be a significant number of QBSS-compliant domains (since the minimal requirement is often already met in any router configuration unaware of quality of service issues).

How? (More precisely.)

- Any packet leaving the domain **MUST** be marked with the QBSS codepoint if that packet entered the domain (either from a peering domain or from an end host) marked with the QBSS codepoint
- Routers in a participating domain **SHOULD** do one of the following:
 - forward Scavenger traffic independently from best-effort giving it a lower probability of timely forwarding than that of best-effort (DSCP 000000) traffic
 - treat Scavenger traffic in the same manner best-effort is treated
- There **SHOULD** exist a minimum departure rate for QBSS traffic
- All bandwidth not used by other types of traffic **SHOULD** be available to QBSS traffic

Incentives

- Self-policing users exist—no incentive necessary for them
- If network charges per bit, can charge less for QBSS
- Administrative pressures and policies
- Colleagues knocking on office door
- Network admin knocking on dorm door
- Non-voluntary marking: everything out of a particular port

Beware of layer 2+ criteria

It may be tempting for a network admin to identify traffic of a particular application by, say, port numbers, and start marking it for QBSS.

This is a road to traffic indistinguishability collapse: If we do that, everything will be layered on top of HTTPS, use random negotiated port numbers, use proxies, etc.

Net result: Back to square one, but cannot any longer even study how your network is used.

What do I gain from QBSS?

Power users: Ability to self-police easily; get everything from a network nobody else wants.

Network admins: Extend life of uncongested best-effort service within your network; get a negotiating tool for price of packet delivery outside of your network.

How do I participate?

Power users: Start marking your time-insensitive non-interactive TCP flows for QBSS.

Network admins: (Must pass QBSS codepoint.) Monitor your network for QBSS traffic; suggest use of QBSS to power users; configure QBSS queue (start with your bottlenecks).

Resources

- QBSS Design Team: <http://qbone.internet2.edu/qbss/>
 - Mailing list archive
 - Milestones
 - Service definition document
- Bulk Handling PDB draft: <draft-ietf-diffserv-pdb-bh-02.txt>