Summary. End-to-end QoE is the driving force behind Internet application ecosystem. The Internet application ecosystem consists of many subsystems, Cloud, ISP, CDNs, etc, and the way they work today follows an simple assumption that a subsystem should optimize all users using the same performance objective, if they look functionally the same (same service, business relationship, etc).

However, the Internet application ecosystem is essentially a faderated architecture. It has two profound implications: (1) For each end user, the perceived QoE can be affected by any subsystem along the way. (2) For each subsystem, it serves users whose QoE has different sensitivity to its quality.

This proposal is based on a simple insight: a subsystem should treat each user differently depending on how much its impact on the user's quality is, even if they look the same functionally. This means that [briefly describe why this is beneficial]

Intellectual Merit. This proposal applies this idea in the context of cloud services. [what it means to cloud services? requests are going to be treated differently, etc] Specifically, this idea can be applied to many services inside a cloud. [talk about more applications] In this project, we plan to answer three key question:

First, how much potential benefit does this idea have?

Second, how to design a QoE-aware cloud scheduling/resource allocation mechanism?

Third, how to propogate QoE information from users to the cloud?

Broader Impacts.

Keywords.

1 Introduction

QoE matters to everyone!

1.1 Missed Opportunities

- Today's tenant: every user should be treated with the same performance goal. Implicit assumption is that the impact of a subsystem is the same on all users.

- However, the federated architecture means:
  1. QoE can be affected by any subsystem
  2. Each subsystem services users with different QoE sensitivities.

- Fundamental mismatch: some users who are less sensitive to the subsystem get over-optimized, while others who are more sensitive to the subsystem get under-optimized.

- New approach: minimize the overall impact on QoE.

1.2 This proposal: Making Cloud QoE-Aware

- How the cloud works today – agnostic to QoE

- Examples of how things can be done differently!

1.3 Research Roadmap:

- First, how much potential benefit does this idea have?

- Second, how to design a QoE-aware cloud scheduling/resource allocation mechanism?

- Third, how to propogate QoE information from users to the cloud?

2   Quantifying the potential improvement

3 Architecting for QoE-aware cloud

4 Propogating QoE information