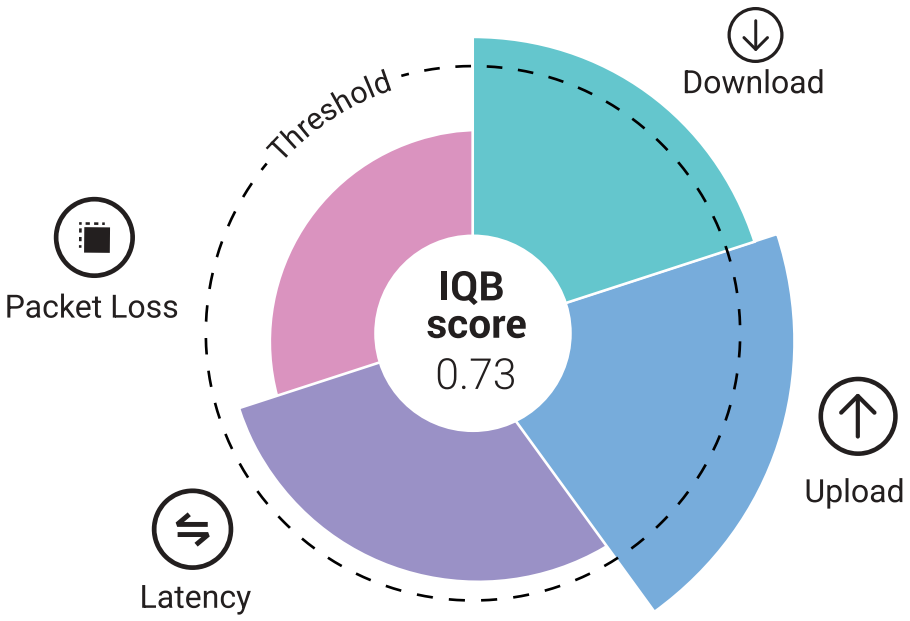
Internet Quality Barometer Framework

Redefining Internet quality beyond speed



Measurement Lab

CS&S Code for Science & Society

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Internet Society Foundation

Executive Summary

Introduction and Goals

The Internet Quality Barometer (IQB), an initiative led by M-Lab and funded by the Internet Society Foundation's Research Grant program, seeks to redefine Internet quality beyond "speed." This public report introduces a holistic framework that will be the basis for an IQB tool that will provide stakeholders with actionable insights that support smarter policies and a more equitable Internet. The goals of IQB are:

Shift the conversation around Internet Quality beyond speed

We want to shift the focus of policymakers and advocates beyond speed as the only measure of Internet Quality and spark conversations about a broader set of meaningful metrics.

Help decision-makers make sense of the data

With so much data out there, it's easy to feel overwhelmed. IQB aims to simplify the conversation by giving decision-makers the information framework they need to turn information into smart, impactful decision-making strategies.

Empower users to make more informed decisions about their Internet

By providing clear, accessible insights, IQB helps users understand their Internet experience and advocate for better service and policies.

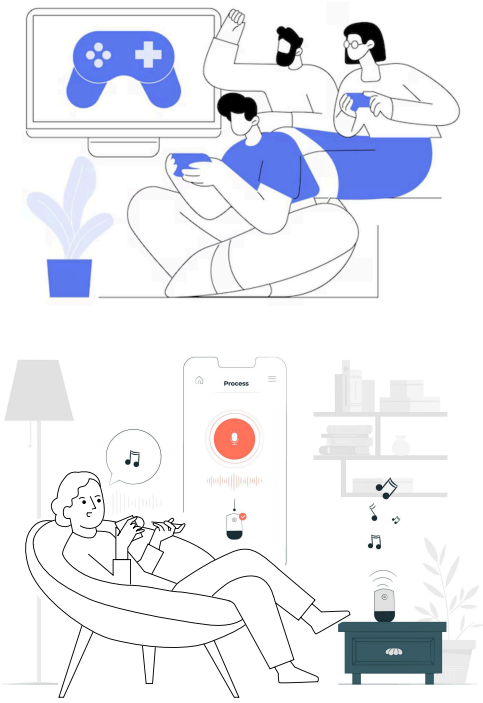
Use existing, openly available datasets as complementary sources

Rather than try and standardize upon one measurement methodology, IQB aims to make use of the multiple datasets that exist by treating them as complementary pieces of a larger puzzle.

Advocate for the collection of more nuanced metrics

That said, while we're helping policymakers understand the data we already have, we're also pushing for new metrics that dig deeper and capture more nuanced complexities of Internet quality.

Ultimately we believe that better data will lead to a better Internet. By accomplishing the goals above, IQB will help foster a more transparent and accessible understanding of Internet quality, and provide the framework through which an improved Internet can be developed.



Gaming and audio streaming are two common use cases for modern Internet users.

The IQB Framework

To create the IQB framework, M-Lab engaged with more than 60 experts across various fields, including academic network research, public policy, digital inclusion advocacy, Internet service provision, speed test data analysis, content provision, and other related domains from November 2023 to March 2024.

From the outset, we recognized the importance of creating a framework that is **accessible to high-level decision-makers** while also garnering **buy-in from experts**. The IQB framework takes inspiration from the credit score—a measure of an individual's "creditworthiness" used by financial institutions—and the Nutri-Score, a nutritional rating system that evaluates the nutritional value of food products. These examples illustrate how a single score can provide a generalized or approximate assessment while being grounded in expert consensus about the key factors and formula used to calculate it. Such frameworks also allow users to explore the underlying formula for greater transparency and provide experts with a platform to contribute feedback, suggestions, and critiques. This iterative process is akin to how standards evolve within organizations like the IETF or other Internet governance bodies.

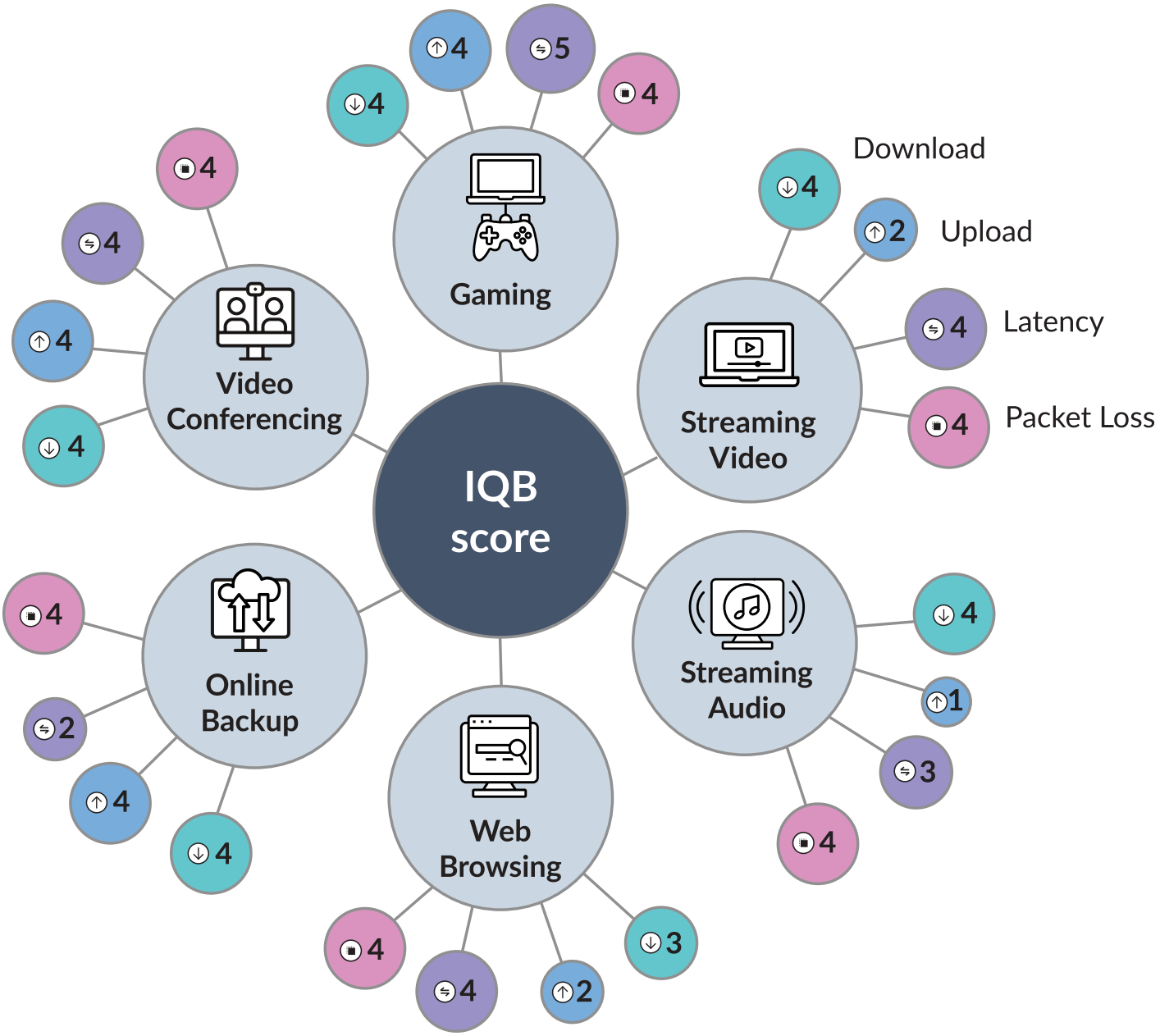
The IQB framework is organized into three tiers: **use cases, network requirements,** and **datasets**. The tiered structure bridges different levels of abstraction. While users and decision-makers rarely think of Internet quality in terms of metrics like throughput, latency, or packet loss, they understand it through what the Internet enables them to do.

> **The use cases tier** reflects the macro-level by identifying activities users should be able to perform online to have a high or minimum-quality experience.

> **The network requirements tier** translates each use case into specific technical needs. For example, what network conditions are necessary for a high-quality video streaming experience? This layer highlights nuances often overlooked in speed tests, such as the differing importance of throughput and latency depending on the use case. Throughput may be critical for downloading large files, while latency is essential for video conferencing.

The datasets tier maps these network requirements to openly available datasets. For instance, if video streaming requires at least 100 Mb/s download speed, the datasets layer identifies open Internet measurement datasets that measure this and determines whether or not the results show evidence of meeting those requirements. Metrics may vary in relevance depending on the use case—e.g., Dataset A may better capture latency for video conferencing than Dataset B. To account for such variations, datasets are weighted based on their applicability to specific use cases.

Each tier produces a value which is aggregated at the top tier to produce an Internet Quality Score. The full report has details regarding the aggregate formula.



This figure illustrates how network requirements contribute to use cases, and how the use cases contribute to the IQB score.

The Future of IQB

This report reflects the first stage of the IQB initiative to redefine Internet quality beyond speed. In the first stage, the primary goal was to lay a strong foundation for future iterations, tools and applications of the IQB framework that will help ensure it can last the test of time. **Prospective next stages of IQB would involve creating a data collection tool, a global IQB pipeline and dashboard, establishing a governance structure, and potentially creating new measurement methodologies.**

As Internet use continues to evolve, so too must the ways we measure and advocate for high-quality connectivity. The IQB framework is designed to be iterative, continuously refined based on new insights and advancements in measurement methodologies. By fostering transparency, inclusivity, and expert-driven dialogue, IQB not only enhances our understanding of Internet quality but also equips decision-makers with actionable intelligence to drive positive change. Ultimately, by shifting the conversation away from a single dominant metric and toward a broader, more nuanced understanding of performance, IQB helps ensure that Internet quality keeps pace with the growing demands of users worldwide.