Foreword
The Internet Society develops its Global Internet Reports to bring significant features of the Internet’s evolution to the attention of the global Internet community. The report normally contains some recommendations about the topic, proposing action to be taken or avoided as the topic and conditions warrant. This year, we examine the topics of concentration and consolidation on the Internet.

There can be little question that the Internet is facing change due to concentration and consolidation. The two patterns are linked but nevertheless distinct. We can observe the patterns at several levels:

- Transit on the Internet is consolidating. Long-haul transit operators are becoming fewer but larger because of mergers and acquisitions. Even in access provisioning, some jurisdictions are seeing fewer, larger ISPs and consolidated offerings across the market.

- Delivery of standard Internet services is consolidating in large providers. For several years now, for example, most Simple Mail Transport Protocol (SMTP) traffic has come from just a few mail service providers, who provide that service for a very large percentage of Internet users, including businesses. Similarly, the Domain Name System (DNS) services were historically operated in a highly distributed way. Today, a small number of large providers serve the domains of most commercially-significant domains on the Internet, and actual resolution of names (turning the names we click on into numbers that connect between computers) is often provided by a small number of resolvers. The DNS protocols are even changing in a way that reinforces this trend.

- Infrastructure, both to operate services and run applications, is increasingly provided in cloud and edge computing environments. These services deliver to even the smallest customers capabilities that were once available only to the largest operators, if they were available at all.

- Web applications and platforms, which are built atop the public Web but usually depend on proprietary APIs, appear to function as near monopolies. They are subject to rock star economics, where only the largest and most famous profit.

All of these patterns are observable on the Internet today. Each has the potential to alter how the Internet works, and together they may represent a challenge to the traditional Internet architecture. They may change what sorts of development we should expect.

It is important to state that this evolution isn’t necessarily good or bad. It is merely an observable fact about the Internet’s evolution. This year, the
Internet Society intended to lay out what that evolution is, what it might mean for Internet users, and what the appropriate technical and policy responses might be.

We discovered that we had set ourselves an unreasonable task. Our analysis did not lead to a clear set of recommendations, but instead to an even longer set of questions that we think we need answers to before we have anything sensible to recommend.

Of course, knowing what one does not know is already an advance from pure ignorance. And, we can say that we have uncovered indicators in both directions. For example, we can see that some options for people on the Internet have clearly become better, cheaper, or both due to the existence of very large economies of scale. Some platforms have become massively successful, and we might reasonably infer that this is partly because they provide something their users want.

In addition, large providers can bring to bear technical expertise that most ordinary enterprises cannot: only large operators have the capacity to employ specialised protocol and security experts, for instance. At the same time, consolidation of Internet service onto a few proprietary systems controlled by few (perhaps even fewer) companies with enormous financial resources may present a challenge both to the Internet and wider society. Moreover, highly integrated systems that depend on a single vendor may be more brittle, or subject to failures that have widespread effects.

Accordingly, this Global Internet Report provides the questions for subsequent efforts to answer. Such efforts will allow further understanding that can provide the path forward for the global Internet community. In the coming year, the Internet Society will do the necessary research, with the goal of providing a more positive program in the next report. At the same time, this uncertainty warns us all against too-hasty regulatory or legislative action. It is possible that some developments that look alarming might turn out, on balance, to be good for people, and it would be unfortunate if those good developments were damaged by hasty regulations or laws.

This Global Internet Report tells us that the Internet Society has a great deal of work to do. We must understand what concentration and consolidation on the Internet mean, both for its architecture and for the wider society that depends on the Internet. We must understand what is really happening to the Internet in order to ensure that we build the Internet for everyone.