
Executive Summary

We present IIR Vol. 62, the first edition for 2024. For Japan, the year began with a huge earthquake that hit the Noto Peninsula. We offer our deepest sympathies to everyone affected by the 2024 Noto Peninsula earthquake.

On New Year's Day afternoon, a magnitude 7.6 earthquake with a maximum seismic intensity of 7 destroyed local residents' infrastructure in the blink of an eye. Telecommunications infrastructure was no exception. The four mobile carriers held a joint press conference to disclose the damage caused by the earthquake, including power outages to buildings and base stations and the disconnection of trunk and backhaul circuits. As has been pointed out during previous disasters, the ability to use the Internet via smartphone as one would during normal times is crucial during emergencies. Reports coming out of the press conference, too, highlighted the fact that mobile communications are essential to users, and that electrical power and optical fiber constitute the foundations on which such communications depend.

Physical steps, such as deploying mobile power supply vehicles and generators, are needed to furnish electric power, but in this case, satellite communications stepped in as an alternative to backhaul circuits. Satellite mobile phones have also been used during past disasters, but in the case of the recent earthquake, high-speed data communications using low-orbit satellites were made available to function as base station backhaul circuits and Wi-Fi hotspots, and reports indicate this to have been extremely useful. This experience showed that, even in the broadband era, satellite-based wireless communications can be used to supplement optical fiber and terrestrial wireless communications.

The IIR introduces the wide range of technology that IJ researches and develops, comprising periodic observation reports that provide an outline of various data IJ obtains through the daily operation of services, as well as focused research examining specific areas of technology.

Chapter 1 presents our SOC Report, our periodic observation report for this edition. As usual, this report looks at security incidents on which IJ's SOC focused its attention from among those that occurred in 2023. This is followed by two discussions looking at the SOC's efforts to address certain challenges. The first looks at challenges with the Data Analytics Platform that the SOC operates and the introduction of a tool called dbt. The second discusses a method of enabling the visualization of C&C communications with a focus on time interval variability. I think you will find both to be interesting accounts of some of the actual work that IJ's SOC carries out.

Our focused research report in Chapter 2 discusses a method of constructing sender reputation based on a paper titled "Sender Reputation Construction Method And Feedback Loop Using Sender Authentication," presented at the Information Processing Society of Japan. Email has been in widespread use since the Internet's early days, and that remains true today, and so there are strong social reasons for maintaining the security of email. The method proposed here only uses the results of sender authentication. There is no need to look at the content of email, which makes the method valuable from a privacy perspective as well. The team behind this method obtained good results when testing it on real-world emails too, which seems to validate the effectiveness of send authentication technology here.

The focused research report in Chapter 3 continues our series commemorating IJ's 30-year history, this time with a look at data centers. The article walks through IJ's data center initiatives through the years, from the 1990s and the dawn of the Internet era through to the 2020s and the rise of demands for carbon neutrality and AI in the data center. Technology has evolved substantially over the past 30 years, and the Internet and society at large have undergone huge changes. Data centers are an important piece of the infrastructure that has underpinned those changes, and we look back on those 30 years with the strong sense that they will continue to play that role in the future. I encourage you to read through.

Through activities such as these, IJ strives to improve and develop its services on a daily basis while maintaining the stability of the Internet. We will continue to provide a variety of services and solutions that our customers can take full advantage of as infrastructure for their corporate activities.



Junichi Shimagami

Mr. Shimagami is a Senior Executive Officer and the CTO of IJ. His interest in the Internet led to him joining IJ in September 1996. After engaging in the design and construction of the A-Bone Asia region network spearheaded by IJ, as well as IJ's backbone network, he was put in charge of IJ network services. Since 2015, he has been responsible for network, cloud, and security technology across the board as CTO. In April 2017, he became chairman of the Telecom Services Association of Japan's MVNO Council, stepping down from that post in May 2023. In June 2021, he also became a vice-chairman of the association.