



Re: Telecom Notice of Consultation CRTC 2022-147

Canadian Internet Registration Authority | October 06, 2022



Executive Summary

- 1) The Canadian Internet Registration Authority (CIRA) commends the Canadian Radio-television and Telecommunications Commission (CRTC) for its commitment to improving the affordability, accessibility, reliability and quality of telecommunications services in the Far North.
- 2) CIRA's submission reflects its role as (a) the .CA country-code top-level domain registry operator, (b) its experience with the CIRA Internet Performance Test and Internet Exchange Points, (c) experience in domestic and global internet governance and policy and (d) as a cybersecurity services provider.
- 3) Drawing on this experience, CIRA's comments focus on improving the reliability and quality of internet services in the Far North. They seek to answer questions 20-22 provided in the Notice of Consultation CRTC 2022-147.
- 4) Specifically, CIRA submits that:
 - a. Network performance testing should be (i) used to establish a benchmark for the current state of connectivity in the Far North and (ii) used on an ongoing basis to track changes and support improvements to network services.
 - b. The CRTC should assist service providers in improving the redundancy and resilience of their networks, in part through the expansion and promotion of Internet Exchange Points (IXPs) in the North.

About CIRA

- 5) CIRA is a member-based, not-for-profit organization best known for managing the .CA country code top-level domain on behalf of Canadians. CIRA operates the .CA registry and associated .CA domain name system (DNS) network, with over 3.3 million domains under management.
- 6) While CIRA's core mandate is the safe, stable, and secure operation of the .CA domain and its underlying technologies, the organization also connects, protects, and engages the internet community in Canada and beyond by providing high quality registry, DNS and cybersecurity services.
- 7) CIRA runs a Community Investment Program to help Canadians thrive online and ensure that the internet is a force for innovation, connection, and trust.² This includes, (1) the Grants program, which gives \$1.25 million to community-led internet projects every year, (2) CIRA Canadian Shield, (3) the Canadian Internet Governance Forum, (4) our involvement in Internet Exchange

Points, which makes Canada's internet faster, cheaper, and more reliable, and (5) the CIRA Internet Performance Test.

- 8) CIRA is committed to building a more trusted internet for Canadians, in which Canadian networks are global leaders in access, speed, quality and data sovereignty.

Introduction

- 9) CIRA welcomes the opportunity to comment on how to improve internet access and reliability for residents in the Far North. CIRA believes that the internet is central to Canadian life and vital for the full participation in our economy, society and democracy. As such, access to reliable, resilient and high-performing internet services is essential.
- 10) CIRA's experience with the Internet Performance Test (IPT) and role in the development of Canadian Internet Exchange Points serves as the foundation for the comments in this submission. CIRA's experience in domestic and global internet policy and governance and technical understanding of internet architecture are also reflected in the recommendations.
- 11) CIRA's IPT is one of the most advanced tests of internet speed and quality available, with the public interest at its core. It measures the actual performance of an internet connection in network conditions, closely representing the internet experience of Canadian users. Over 1.3 million tests have been run in Canada.
- 12) Building on the IPT platform, CIRA has worked with municipalities, provinces and other stakeholders to enable decision-makers to better understand the state of connectivity in their community. This includes the Government of British Columbia, municipalities and counties from across the country, and associations like the Rural Municipalities of Alberta.
- 13) CIRA's submission focuses on improving the reliability and quality of internet services and infrastructure in the Far North, and addresses the following questions set out in the Notice of Consultation:
 - a. **Q20:** Do you think the CRTC should take action to improve the quality of Northwestel's Internet network? For example, should the CRTC take action to improve the speed of Internet service? Why or why not? If so, explain what actions the CRTC should take.
 - b. **Q21:** Do you think the CRTC should take action to improve the reliability of Northwestel's Internet network? For example, should the CRTC take action to reduce the duration and frequency of network outages (sometimes, this is referred to as bringing redundancy to a network or making a network more resilient)? Why or why not? If so, explain what actions the CRTC should take.

- c. **Q22:** Do you think the CRTC should require Northwestel to develop a network improvement plan? Why or why not? If so, describe the network improvement plan and benefits. For instance, network improvements may include upgrades to transport facilities, network redundancy, upgrade and/or expansion of Internet services across Northwestel's operating territory, improvement of broadband Internet services in satellite-dependent communities, etc.

Network performance testing should be (i) used to establish a benchmark for the current state of connectivity in the Far North, and (ii) used on an ongoing basis to track changes and support improvements to network services (Q20, Q22)

- 14) CIRA submits that a logical first step to improve the quality of an internet service providers' network is to assess the current state of its services to customers, with a particular focus on network performance and downtime.
- 15) In Telecom Decision 2018-241, the CRTC determined that a particular measurement methodology should be used in its Broadband Measurement Project. Specifically, the Commission found the following:
- 16) ... *broadband [quality of service] QoS is to be measured using a sample-based approach, during peak times... and using a measurement probe at the modem in the customer premises to an off-net measurement server connected to an [Internet Exchange Point] IXP in a Canadian Tier 1 city.*⁸
- 17) CIRA agrees that this is the appropriate testing methodology, as it assesses the speed and quality of broadband services under real world conditions and provides a truer portrait of a user's internet experience, and therefore, should also be applied to measure network performance in the Far North.
- 18) By using quality of service (QoS) testing to establish the baseline state of connectivity in the Far North, the data can be used to strategically allocate resources for the improvement of the networks in order to maximize return on investment and target the service areas with the highest need.
- 19) CIRA submits that independent, third-party QoS audits ought to be conducted for all broadband projects across the country to ensure they meet the minimum standards set out in the CRTC's universal service objective. Given the significant broadband inequities experienced by Northern residents, the need for QoS testing is even more urgent to help maximize return on public and private investment and ensure Canadians receive the improved network performance they are

promised.

- 20) CIRA submits that these audits should be conducted quarterly to track progress towards the CRTC's universal service objective. For example, the results could be published as part of the CRTC's regularly scheduled Communications Market Reports quarterly updates.
- 21) There are various network performance tests that should be used in a measurement toolkit to establish this baseline and as network improvements are facilitated. Self-reported data from internet service providers, for example, is very useful for identifying connectivity gaps. However, layering in third-party QoS data offers a more comprehensive picture.
- 22) CIRA's IPT is one example of such third-party QoS tests. It measures the actual performance of an internet connection in network conditions, closely representing the experience of Canadian users. Over 1.3 million tests have been run Canada-wide. CIRA has worked with municipalities, economic development groups, researchers, provinces, and other stakeholders to enable decision-makers to better understand the state of connectivity in their communities.
- 23) Third-party testing of network performance can demonstrate gaps, weaknesses, and strengths in regional connectivity. Decisions related to network investments and improvements can be made by using this type of measurement methodology that reflects subscribers' real-world experiences.

The CRTC should assist service providers in improving the redundancy and resiliency of their networks, in part through the expansion and promotion of Internet Exchange Points in the North (Q21)

- 24) The CRTC should encourage the expansion of IXPs across Canada, including in the Far North. IXPs are microcosms of the internet itself; they are an ecosystem where content providers can peer with internet service providers, and where governments and businesses can serve end-users with essential services directly by providing high-bandwidth and low-latency access at a lower cost than traditional transit.
- 25) However, CIRA recognizes that the benefits of IXPs are contingent on having adequate transport networks to support this infrastructure, which are not currently present throughout the Far North.
- 26) The CRTC should encourage key service providers to peer at IXPs, particularly as they develop in the Far North. This will help improve the internet experience for users in these areas. Moreover, there are many benefits of peering in Canada, including:
 - a. Improving performance by reducing latency between connection points;

- b. Increasing resilience through reduced congestion, improved uptime, and mitigating cyber-attacks;
- c. Accessing global content – internet service providers and enterprises can gain low-latency, low-cost access to major content providers;
- d. Reducing transit costs – peering lowers the average per-bit delivery cost by reducing the need for transit;
- e. Supporting DNS resolution resilience – resolving DNS queries is critical for modern IT infrastructure and having diverse paths via transit and through the IXP to resolve .CA and other TLDs directly is very important.

27) CIRA submits that Internet Exchange Points (IXPs) make the internet faster, safer and more resilient. IXPs also reduce costs and improve the efficiency of data travel. As such, leveraging the benefits of IXPs would be helpful in improving the redundancy and resilience of networks in the Far North.

Conclusion

28) CIRA submits that the internet is central to Canadian life and vital for the full participation in our economy, society and democracy. As such, access to internet services is essential. There are many steps to improve the reliability and quality of the internet in the Far North.

29) Specifically, CIRA submits that:

30) Network performance testing should be used to establish a benchmark for the current state of connectivity in the Far North and used ongoing to track changes and support improvements to network services.

31) The CRTC should take action to assist service providers in improving the redundancy and resilience of its network, in part through the expansion and promotion of Internet Exchange Points in the North.