TELSTRA GROUP LIMITED

Submission to Senate Inquiry:

Optus Network Outage

Public Submission

17 November 2023

1 Introduction

Telstra appreciates the opportunity to make this submission to the Senate Inquiry into the Optus Network Outage on 8 November 2023. Our submission focuses on matters related to emergency calls to Triple Zero and Temporary Disaster Roaming (TDR).

At the outset, it is important to acknowledge the complexity inherent in modern telecommunications networks. While all network operators strive to minimise network problems by building in redundancy and resiliency into their networks, all networks can, and do, suffer major outages from time to time. It is not realistic to expect that major outages can be eliminated entirely.

2 Triple Zero contact centres operated normally through the Optus Network Outage

The Triple Zero Emergency Call Person Answer Point is run by Telstra under contract with the Australian Government. We confirm that the service operated as per normal through the outage. All calls successfully delivered to the Triple Zero Emergency Call Person Answer Point were answered.

We do not have visibility of Optus customer experiences related to their ability to place successful Triple Zero calls. However, we did answer some emergency calls from Optus customers during the outage, both via the emergency call camp-on mechanism (see section 3 below) and from their fixed and mobile networks.

3 Triple Zero Emergency Call Camp-On

Emergency call camp-on is a globally standardised mechanism which enables a mobile caller, who is outside the coverage of their own Mobile Network Operator's (MNO) network coverage, but is within coverage of another MNO's network, to make an emergency call to Triple Zero. The most common scenario where a device is outside the coverage of its own network, or when its unable to attach to its own network due to an outage affecting the network radio base stations. Emergency call camp-on is not available to fixed line customers; it only works for mobile services.

When making a Triple Zero call, if a user device is unable to find a suitable base station on its own network to connect with, it uses the emergency camp-on feature to connect with the base station from any other network that has coverage in the area. Once connected, the device enters a "limited service" state. Handsets are in this state when they display a message such as "Emergency Calls Only" or "SOS". Any user can make a Triple Zero call while the devices is in this state, as the usual authentication protocols are bypassed. This feature also allows for devices that do not have a SIM (or eSIM) to make emergency calls to Triple Zero.

During the Optus Network Outage, Telstra's network continued to be available to accept emergency call camp-on requests from devices.

4 Temporary Disaster Roaming will not work for a core network outage

Temporary Disaster Roaming (TDR) is a concept currently being explored by MNOs for a possible future capability that could be activated during a natural disaster, such as a bushfire or flood. The concept of TDR is to provide end users access to another MNO's network where the **Radio Access Network** (RAN) in one or more mobile networks is disrupted, or an MNO does not have coverage in a location where a disaster is unfolding.

It is important to recognise that if TDR is implemented by MNOs, it is only intended to be capable of addressing network outages that occur in the RAN over a localised area. The RAN comprises mobile **base stations** and the **backhaul** from the mobile base stations to points higher up in the network architecture. In the event that elements in one MNO's RAN are disrupted (e.g., loss of mains power, physical damage such as fire or flood to base station equipment), or an MNO does not have coverage, a "surviving" mobile network will provide local access for end users of the disrupted MNO.

The TDR solution currently being considered in Australia would not be capable of compensating for an outage in the core network of a disrupted MNO. This is because roaming, even temporarily, requires authentication of the end user by their MNO and ultimately the routing of their traffic back to the core network. Authentication of an end user can only be done by that user's MNO, and the authentication requires communication with the core of that MNO's network. Thus, even if a TDR capability, as currently being considered, had been available on 8 November, it would not have been able to provide service to Optus' customers as all communications with the Optus core network were disrupted.

Further, even if the core network remains accessible and authentication for TDR is possible, there is a high risk that the sudden increase in new connections and traffic from roaming end users would overwhelm the host network. Submissions to the ACCC's Regional Mobile Infrastructure Inquiry,[1] and the inquiry's final report,[2] also highlight the significant risk to a surviving network being overwhelmed by the volume of authentication requests, and ongoing network congestion arising from the significant influx of users. Mobile networks are dimensioned to accommodate the users and traffic commensurate with their market share of the Australian population, which is why the scope of TDR currently being explored by the MNOs is limited to very localised geographic regions around a natural disaster.

To enable full customer failover during a national mass outage, an alternate solution to TDR would be required and would have to involve either: a) each MNO having loaded all subscriber records for every customer from other MNOs in their systems; or b) Australia having put in place a single national register of customer subscription records accessible by all MNOs. Both options would require a solution that overcomes the network variations, feature differences or incompatibilities, authentication key synchronisation, security concerns of sharing SIM card encryption keys and proprietary information in subscription records. Implementing such a solution would be highly complex, is likely to be very expensive, and we are not aware of any other country doing this yet. The risk of overloading a host MNO with mass failover of customers would also remain.

1 ACCC Regional Mobile Infrastructure Inquiry. https://www.accc.gov.au/inquiries-and-consultations/regional-mobile-infrastructure-inquiry-2022-23

2 ACCC RMII Final Report. https://www.accc.gov.au/inquiries-and-consultations/regional-mobile-infrastructure-inquiry-2022-23/final-report

Finally, it is worth noting that mobile roaming is a concept constrained to mobile networks. Mobile roaming will not be of assistance to fixed line services, and even where residential gateway modems for nbn services include “4G fallback”, it would be necessary to exclude such devices from a TDR solution due to the significant traffic that fixed-line access networks can generate.