

Preliminary Report on CSL Service Interruption on 13 May 2013

1. Introduction

On 13 May 2013, CSL 2G & 3G services covering Shatin/Tai Wai/Ma On Shan/Tai Po areas were interrupted for about 1.8hrs, affecting both voice and data services. 4G LTE coverage plus its associated data services were not affected. This preliminary report summarized the event of this incident and the steps taken to recover our services.

2. Incident Description

The service interruption was found to be caused by a software problem, which corrupted a 3G Radio Network Controller (RNC) configuration file, causing failure of both voice and data service under the aforesaid areas. When the 3G handsets attempting on 2G layer, the enormous traffic volume had overloaded a 2G Base Station Controller (BSC) covering the same areas resulting into intermittent or failure to access voice and data services.

3. Incident Event Log

Date and time of the outage incident: 13 May 2013, 10:10pm to 14 May, 12:00am
Affected areas: Shatin/Tai Wai/Ma On Shan/Tai Po
Estimated number of customers affected: 20,000 active customers

Time	Event
10:10pm	CSL's Service Operations Centre observed alarms in the RNC and BSC serving Shatin/Tai Wai/Ma On Shan/Tai Po areas. Customers also reported difficulty in accessing 2G and 3G voice and data services in the affected areas. The problem was immediately escalated to support engineers and vendor for investigation.
10:15pm	Support engineers tried to recover the respective RNC and BSC by hardware and software reset but could not restore their traffic handling ability. Vendor was investigating the problem in parallel.
10:40pm	Vendor support engineers identified part of a RNC system configuration file was corrupted and a BSC was being flooded with customers who were falling back from the 3G network.
10:50pm	Vendor tried restoring the RNC system configuration file from the latest backup but the RNC could not be started up properly. Suspected the corruption had extended to the latest backup version.
11:06pm	CSL's Service Operations Centre contacted OFCA duty officers to report the incident to proactively provide information and minimize confusion.
11:30pm	Vendor attempted to restore the RNC from the next older version of backup file. After completion of the restoration of the file, the problematic RNC became operable.
12:00am	All affected cell sites resumed operation. Verified with traffic data and

	customers that 3G service was restored and the congestion in the BSC was also relieved.
12:03am	CSL's Service Operations Centre provided update to OFCA duty officer that the service resumed normal. Agreed with OFCA to provide another update before 1:00am.
12:56am	CSL's Service Operations Centre provided update to OFCA to confirm again resumption of service after observing network statistics and customer feedback.

4. Remedial Actions Taken

It is the network design of CSL to allow 2G network picking up traffic from 3G network when the latter encounters problem. This mechanism worked as planned at that time but the performance of 2G network was observed with degradation due to repeated access attempts by the affected customers during the incident.

Our support engineers and vendor took immediate actions to investigate the problem. Our vendor had identified that the problem with the RNC was due to corruption of part of the RNC configuration file. We then reloaded the RNC with the latest backup file but failed. Our vendor suspected it might be related to corruption of the backup file. We decided to reload the problematic RNC with the next older version of backup file and successfully restored the RNC. The congestion on 2G BSC was also relieved.

5. Root Cause Analysis

According to the preliminary findings and analysis, there were two key points to address:

a) RNC configuration data corrupted

At the time of the service outage, the RNC configuration data showed corruption that caused cell sites failure to handle traffic. Our vendor and we will investigate under what scenario the corruption would be generated.

b) Underlay BSC was unable to take up all traffic from 3G

According to the network design, our 3G users would automatically select 2G network when 3G network was unavailable. As a result, we observed the respective underlying BSC was being overwhelmed by our customers' repeated attempt to get voice and data services at the same time. Such action created a snowball effect causing an overloading of the BSC. Consequently, the affected customers could hardly use the 2G service and some of them might suffer from "no service".

6. Number of Affected Customers

The estimated number of customers affected is less than 20,000 active customers, who might have attempted to make outgoing or incoming call voice or data calls.

7. Communication with Customers and the Media

All staff of customer service hotline were briefed before and after service recovery to handle call enquiries of the incident.

Once the service was back to normal, a SMS message was sent at 00:45am on 14 May to the affected customers who had called in for enquiring the incident to inform them the service resumed normal and to apologise for the inconvenience caused.

A detailed statement was prepared to provide information of the incident including root cause, affected area, time of service interruption and recovery at 10:00 am on 14 May for frontline staff to answer enquiries and for media to understand the incident in more details. The statement also mentioned that the incident had only affected the 2G and 3G voice and data services for around 1.8 hours in the late evening while 4G mobile data service remained normal.

CSL communicated with customers, the media and the general public via the following channels:

Customer hotline

- CSL pulled together all frontline staff at the call centres to handle customer enquiries before and after service recovery.

SMS

- Once the service resumed normal, a SMS message was sent at 00.45am on 14 May to the affected customers who had called in for enquiries on the incident.

Retail shops

- All frontlines were briefed about the incident and the statement for handling potential customer enquiries before the retail shops opened for business on 14 May.

Media

- The statement was issued to the media at 10:00 am on 14 May to inform the details of the incident. CSL had been following up with the media during and after the incident.

Facebook and websites

- The statement was posted on 1010 and one2free official Facebook at 10:00am and 1010 and one2free websites at 11:00 am on 14 May.