

About the Communication Failure on July 2, 2022

We deeply apologize for the extended inconvenience and trouble caused to customers nationwide using our communication services that began on 1:35 a.m. on Saturday, July 2, 2022.

As a telecommunications carrier, supporting social infrastructure and providing stable service, we take such incidents seriously.

We have implemented measures to try to prevent recurrences and will make every effort to foster smooth operations going forward.

Overview and Effect of the Communication Failure

The effect of the communication failure lasted for a total of 61 hours 25 minutes, from July 2 (Sat) 1:35 am to July 4 (Mon) 3:00 pm (JST). As for the scale, about 22.78 million voice users and 7.65 million or more data users were affected in KDDI (non-consolidated). With Okinawa Cellular Telephone Company combined, the number rose to about 23.16 million voice users and 7.75 million or more data users.

The communication failure spread to a broad range of industries

using smartphones and IoT devices, such as logistics, automobile, administrative services, banking, and transportation, affecting the living infrastructure.

Based on the challenges revealed by the incident, in addition to strictly implementing recurrence prevention measures and achieving stable service operations, we are committed to grasping new usage scenes and effects of services as well as establishing timely and appropriate information disclosure to customers.

General Outline of Communication Failure

Affected nationwide customers for a long time

Affected time	From July 2 (Sat) 1:35 am to July 4 (Mon) 3:00 pm (JST) (Total : 61 hours 25 minutes)
Affected area	Nationwide

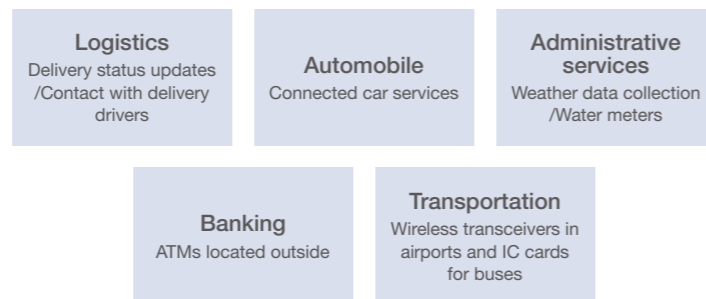
The number of affected customers

Voice (VoLTE)	About 22.78 million
Data (4G/5G)	7.65 million or more

* The scale of the effect is estimated and calculated based on the differences in calls and registration requests between the normal condition (one week before the communication failure, based on the same time frame) and the failed condition.

Impact on Corporate Customers

Affected various industries and living infrastructures



Overview of Communication Failure and Our Response

On July 2, 2022, during maintenance, a routing misconfiguration caused approx. 15 minutes of communication interruption. After we reverted the configuration, a large number of location registration request signals were resent.

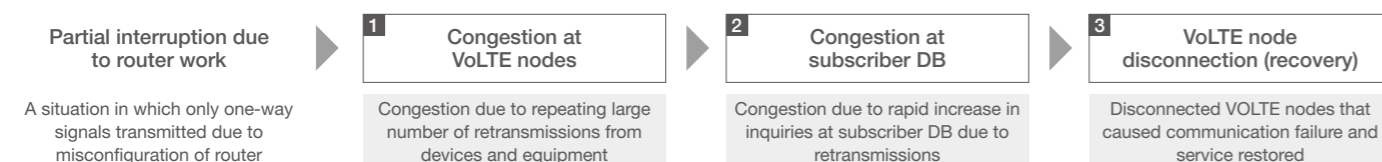
Congestion at "VoLTE nodes" for voice services, congestion at "subscriber databases (DB)" used for subscriber authentication, and data inconsistency of the subscriber databases occurred one after another, causing extended communication failure. We implemented traffic flow rate control and data inconsistency correction measures to reduce system overload, but the insufficient load reduction remained for a long time.

On July 4, 2022, we identified the VoLTE nodes that caused unnecessary excessive signal transmission and separated the nodes. As a result, both voice and data communications were confirmed to have recovered to the same level as the previous week.

To summarize, a routing misconfiguration caused communication interruption, which caused a vast number of location registration request signals, and eventually congested VoLTE nodes and subscriber DB nationwide. The communication failure was recovered by separating the problematic VoLTE nodes.

Overview of the Communication Failure

Large number of location registration request signals generated due to incorrect route settings. VoLTE nodes and subscriber DB nationwide were congested.



System to Drive Quality and Service Improvement

Based on the root cause and challenges of the failure, we built a cross-organizational system, granting the highest priority to network stabilization and improvement of customer relations.

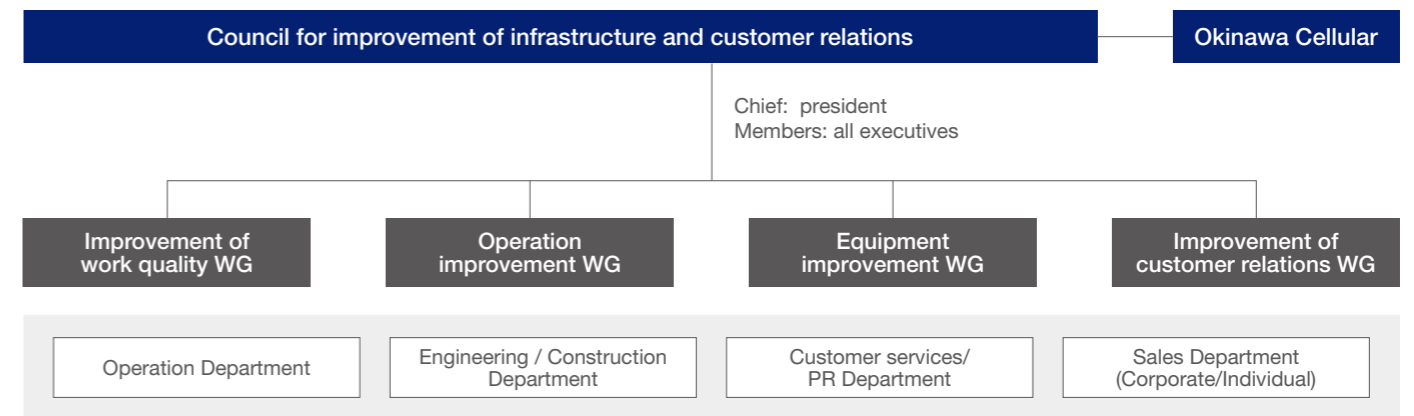
In the "Council for improvement of infrastructure and customer relations," where president serves as the chief, we are actively implementing measures in four working groups: "Im-

provement of work quality WG," "Operation improvement WG," "Equipment improvement WG," and "Improvement of customer relations WG."

Operation, Engineering/Construction, Customer Services/PR, and Sales (Corporate/Individual) Departments collaborate as a company-wide effort.

System to Drive Quality and Service Improvement

Building a cross-organizational system, granting highest priority to network stabilization and improvement of customer relations



Recurrence Prevention Measures

On maintenance work, we will review "Operation Procedure Management Rules," "Check Procedure of Operation Approval," and additionally, "Operational Risk Assessment and Operation Suppression Criteria/Duration."

On scaling the maintenance work, we develop more elaborate tools to detect congestion at VoLTE nodes and redesign congestion control.

In prolonging the maintenance work, we will review recovery procedures when congestion occurs and develop tools to recover congestion at VoLTE nodes.

On customer announcements, we improve information disclosure to customers and facilitate timely and appropriate announcements.

	Implementation details	Implementation period
Maintenance work	(1)Review of Operation Procedure Management Rules, Check Procedure of Operation Approval (2)Review of Operational Risk Assessment and Operation Suppression Criteria/Duration	(1)July 14, 2022 implemented (2)July 22, 2022 implemented
Get larger scale	(1)Development of more elaborate tools to detect congestion at VoLTE Nodes (2)Review and inspection of design for congestion control	(1)July 28, 2022 implemented (2)Inspection completed by the end of August 2022, plans formulated
Prolongation	(1)Review of recovery procedures when congestion occurs (2)Development of tools to recover congestion at VoLTE Nodes	(1)July 11, 2022 implemented (2)August 24, 2022 operation started
Announcement for customers	• Improvement of information disclosure to customers; timely and appropriate announcements	Partially implemented on July 14, 2022, the rest of parts implemented by the end of September 2022

On July 28, 2022, we submitted a serious accident report based on Article 28 of the Telecommunications Business Act to the Ministry of Internal Affairs and Communications (MIC).

On August 3, we received a reprimand and written administrative guidance from MIC to prevent the recurrence of similar accidents.

For the recurrence-preventive measures and other challenges such as announcement methods, we will continue our efforts, taking into account the conclusions of discussions in the investigation committee conducted by the MIC.