



### **Overview of Billing Error on March 1, 2023.**

Scope - 14% of Skyetel customers

Initial recovery - 2 hours and 42 minutes

Full Recovery - 1 day, 13 hours, and 44 minutes

### **Description**

Over the course of the last 4 months, Skyetel has been making sweeping changes to the core billing system that powers all our services. In terms of sensitivity, this is equal to performing open heart surgery on someone while they are running a marathon. The primary purpose of these changes is to increase the volume of CDRs our billing system can process. We can now process *trillions* of CDRs and provide monthly billing and statements in a matter of minutes. As we continue to consolidate the HFA companies into Skyetel, these new limits become important given the volume of traffic Skyetel now processes.

This volume of CDR processing is only possible by switching away from a traditional database structure (MySQL) and into something built for big data (Presto & Parquet). While these technologies speak fluent SQL, they do it with an accent as the underlying dataset does not work using conventional structures. This translates into tiny nuances that, when applied to billions of CDRs, can have a large impact on how our billing system operates. Indeed, this is the root cause of the billing error. The error was caused by using different types of data objects between database types that didn't match up properly. To speak full nerd - the error occurred while calculating the short call conversational surcharge due to a data type mismatch between string and integer values.

Ordinarily, this kind of error would have been caught during pre-production testing and would not have been user impacting. Unfortunately, this mismatch was not caught during testing for the surcharge output because of a missing SQL wildcard character. In other words, a typo in our code caused this to be missed.

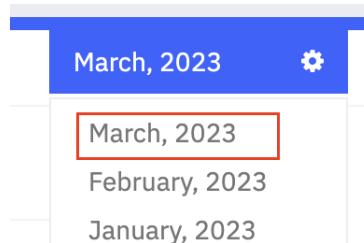
Once we identified the bug, we immediately began refunding customer's Skyetel accounts, and all customer's credit cards were refunded within 24 hours.

## How you can identify if you were impacted

All transactions related to this event (and all our billing in general) are on the Transactions page of your monthly Statement. You can access that here:

<https://login.skyetel.com/#billing/statements>

From this page, navigate to the month of March via the date selector in the top right corner of the page:



You will see all the transactions related to the billing error, and the refunds provided there:

Show  Search:

Date	Description	Amount
3/01/2023, 2:18 AM	Monthly Taxes for February	- \$135.87
3/01/2023, 2:18 AM	Monthly bill for 229 local number(s)	- \$114.50
3/01/2023, 2:18 AM	Conversational Short Duration Charge for 3496 Calls for February	- \$104.88
3/02/2023, 12:32 AM	Billing Error 3/1/23 - Credit Card Refund True Up	- \$104.88
3/01/2023, 2:18 AM	Monthly bill for 9 e911 number(s)	- \$9.00
3/01/2023, 2:18 AM	Monthly bill for 9 toll free number(s)	- \$6.75
3/01/2023, 2:18 AM	Monthly bill for 7 SMS enabled number(s)	- \$0.70
3/01/2023, 2:18 AM	Indeterminate Caller ID Charge for 15 Calls for February	- \$0.15
3/01/2023, 6:12 AM	Billing Error 3/1/23 - CSD Surcharge Refund	+ \$104.88
3/01/2023, 2:47 AM	Auto Recharge	+ \$1,000.00

Showing 1 to 10 of 10 transactions Previous **1** Next

All charges and usage include applicable taxes and fees.

## How the refunds & credits work

Like most large billing systems, the Skyetel Billing system is based on a system of credits and debits and does not allow Administrators to delete transactions. This means that we must add new transactions to the billing ledger in order to correctly true up your balance. This gets confusing, so consider the following example.

Let's say that the accidental Short Duration Surcharge was \$100, and that caused your credit card to be charged \$100. In order to true your Skyetel balance up, and accurately refund your credit card, you will see four total transactions on your Skyetel account, plus a credit card refund.

In accounting terms, it looks like this:

	Skyetel Balance		Your Credit Card	
	Credit	Debit	Credit	Debit
Short Duration Bug		\$ (100.00)		
Credit Card Auto Recharge	\$ 100.00			\$ (100.00)
Short Duration Refund	\$ 100.00			
Credit Card Refund		\$ (100.00)	\$ 100.00	
<b>Total</b>	<b>\$ 200.00</b>	<b>\$ (200.00)</b>	<b>\$ 100.00</b>	<b>\$ (100.00)</b>
<b>Final Balance</b>	<b>\$0.00</b>		<b>\$0.00</b>	

Because we refunded your credit card, we must remove the portion of the refund that was sent to your credit card so that your Balance reflects what it would have been had this bug not occurred – in this case a final balance of \$0.

However, all the other items in the monthly billing process were accurate (things like phone numbers, E911, etc). This means that in most cases, the charge on your credit card is greater than the accidental Short Duration Surcharge.

As an example, imagine that in addition to the \$100 Short Duration Surcharge, you had \$200 of accurate billing. In this case, we would have charged your credit card \$300; \$100 for the Short Duration Bug and \$200 for your monthly billing. In order to reconcile the accurate billing from the inaccurate billing, we then would refund your credit card only the \$100 that was inaccurately billed. Here's what that looks like:

	Skyetel Balance		Your Credit Card	
	Credit	Debit	Credit	Debit
Monthly Billing Items		\$ (200.00)		
Short Duration Bug		\$ (100.00)		
Credit Card Auto Recharge	\$ 300.00			\$ (300.00)
Short Duration Refund	\$ 100.00			
Credit Card Refund		\$ (100.00)	\$ 100.00	
Total	\$ 400.00	\$ (200.00)	\$ 100.00	\$ (300.00)
Final Balance	\$200.00		-\$200.00	

**We Are Very Sorry**

We take tremendous pride in being trustworthy, and events like this strike at that. We are sincerely sorry for this mistake.

Our team worked around the clock to ensure that all customer's accounts were made current, and your credit card would receive the money back prior to the transaction clearing your bank.

Thank you for being a part of Skyetel. You are Awesome.