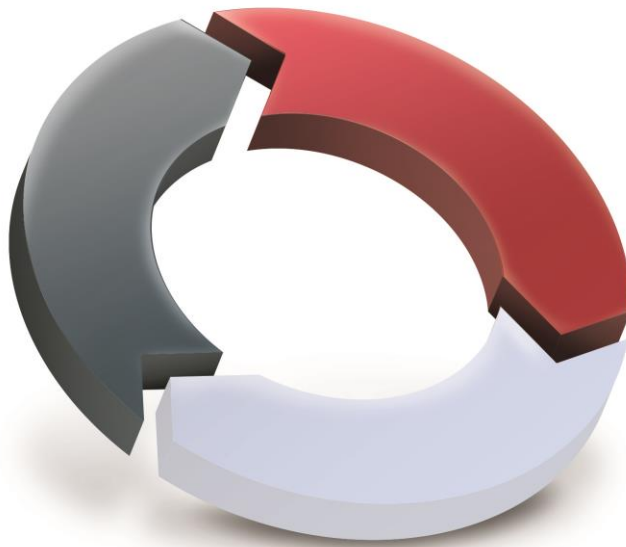# Call Completion Analytics

OVERVIEW - A SENSE OF URGENCY

Recent FCC rulings will soon impose reporting requirements on all facilities-based originating long-distance voice service providers who make the initial call path choice and who have more than 100,000 long-distance retail subscribers.

These 'Covered Providers' are required to collect and retain information on call attempts and to analyze call completion data. Results of the analysis, which will be provided in reports detailing the call answer rate for each rural operating company number, are required to be provided to the Commission on a quarterly basis.

The date of submission of reporting to the FCC will be announced in the Federal Register. Covered Providers will then be required to begin collection of data to be included in reporting the first of the month that is least 20 days after the effective date as announced by the FCC.

BACKGROUND

To understand how the need for such reporting evolved and why the FCC feels these measures will assist in resolving the issues, it's important to have some background information.

Traditionally calls that are terminated to subscribers that reside in rural areas within North America carry a higher cost - sometimes exponentially higher. A concern with rural Local Exchange Carriers (LECs) developed that, as a means to minimize these costs, carriers might be utilizing several practices which degrade the successful completion of calls to those customers residing in rural areas. Practices such as the generation of artificial ringing or busy tones and the utilization of third-party providers who offer call termination services at a lower cost were of concern and suspect.

As a result of alleged ongoing call completion issues experienced by subscribers, a group of rural LECs brought the issue to the attention of the FCC, claiming that long distance calls destined for termination to their subscribers were failing at a rate that was abnormally high. The belief by the rural LECs was that cost saving practices were causing significant issues with the service provided to rural areas and, given a low rate of call reliability, there was concern for potential impacts on economic development and public safety. These allegations prompted a series of actions by the FCC to address concerns over rural call completion, the highlights of which are described below.

- In 2012 the FCC issued a Declaratory Ruling which identified the differential treatment of rural traffic leading to call termination and quality problems as a practice that was 'Unjust' and 'Unreasonable'. Furthermore, it was stated that actions such as this could result in the assessment of financial penalties.

- In February 2013, the FCC adopted a Notice of Proposed Rulemaking (NPRM) soliciting comments from the industry on proposed reporting and data retention requirements which would be intended to allow the FCC to identify and address call completion problems.

COVERED PROVIDERS REQUIREMENTS

In October 2013 the FCC adopted via order FCC 13-135 rulings on the Rural Call Completion issue. The ruling, in addition to addressing artificial call result practices, provides for requirements around the recording, retention, and reporting of detail metrics. The objective of the reporting is to increase the FCC's ability to monitor and address problems to alleviate the issues experienced in rural areas. To that end, each Covered Provider must submit a certified report each quarter providing detailed call completion metrics by month, by Operating Company Number (OCN).

The report will be required to include the data points as illustrated in the FCC provided reporting template.

Covered Provider X		Month 1																						
		Interstate							Intrastate							Total								
State	Rural OCN	Calls Attempted	Answered	Busy	Ring No Answer	Unassgnd Number	% Calls Answered	% Calls Cmpleted	Calls Attempted	Answered	Busy	Ring No Answer	Unassgnd Number	% Calls Answered	% Calls Cmpleted	Calls Attempted	Answered	Busy	Ring No Answer	Unassgnd Number	% Calls Answered	% Calls Cmpleted		
AA	OCNA	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	AA,AAA	BB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%		
AA	OCNB	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	AA,AAA	BB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%		
AA	OCNC	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	AA,AAA	BB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%		
AA	OCND	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	AA,AAA	BB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%		
AA	OCNE	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	AA,AAA	BB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%		
BB	OCNF	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	AA,AAA	BB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%		
BB	OCNG	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	AA,AAA	BB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%		
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ZZ	OCNZ	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	A,AAA	B,BBB	C,CCC	D,DDD	E,EEE	YY.Y%	ZZ.Z%	AA,AAA	BB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%		
Rural [Total]		AAA,AAA	BBB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%	AAA,AAA	BBB,BBB	CC,CCC	DD,DDD	EE,EEE	YY.Y%	ZZ.Z%	AAA,AAA	BBB,BBB	CCC,CCC	DDD,DDD	EEE,EEE	YY.Y%	ZZ.Z%		
Nonrural [Total]		A,AAA,AAA	B,BBB,BBB	CCC,CCC	DDD,DDD	EEE,EEE	YY.Y%	ZZ.Z%	A,AAA,AAA	B,BBB,BBB	CCC,CCC	DDD,DDD	EEE,EEE	YY.Y%	ZZ.Z%	A,AAA,AAA	B,BBB,BBB	CC,CCC,CCC	D,DDD,DDD	E,EEE,EEE	YY.Y%	ZZ.Z%		

Shaded areas are provided on, or calculated by, the template.
% Calls Answered is calculated as BBBB/(AAAA-EEEE)
% Calls Completed is calculated as (BBBB+CCCC+DDDD)/(AAAA-EEEE)
Call attempts are generally categorized as follows based on ISUP Cause values and corresponding SIP Response messages
  Answered = calls signaled back with ISUP 16 & 31 and SIP BYE & CANCEL
  Busy = call attempts signaled back with ISUP 17 and SIP 486
  Ring No Answer = call attempts signaled back as ISUP 18 & 19 and SIP 408 & 480
  Unassigned Number = call attempts signaled back as ISUP 1 and SIP 404

As illustrated, data is to be broken out between rural and non-rural OCNs, where the designation of OCN as rural vs non-rural will be a source of reference data that will be maintained and published annually for use in the subsequent year by NECA. Additionally, data is to be reported by Interstate and Intrastate and separately based on each month of the reporting quarter. The metrics to be provided are the same between rural and non-rural OCN's, however for non-rural OCNs the data should be presented in aggregate as shown in the last row of the illustration above.

As there was concern regarding the inclusion of auto dialer traffic and it's potential to skew the reported numbers, Covered Providers may choose to provide separate calculations in their reports that segregate auto dialer traffic from other traffic. If this is the case, an explanation of the methodology used to identify auto dialer traffic should also be provided. Additionally, a Covered Provider who has both first call path originated traffic and intermediate traffic can exclude the intermediate traffic from their reporting data as this traffic should be reported upon by the first call path provider.

All reporting information will be required to be provided in electronic spreadsheet format to the FCC on a quarterly basis and will be inclusive of the metrics for the three months of the reporting quarter. Covered Providers are also required to retain and store data so that it is readily accessible for review if needed for a period of 6 months.

WHAT SHOULD CARRIERS BE DOING?

As the commencement of the requirements for reporting are imminent, all CSP's that qualify as Covered Providers should be taking steps now to ensure they have the processes and capabilities in place to meet the requirements. The main capabilities to be addressed immediately should be the following;

1. Data collection and retention capabilities which accommodate a minimum of 6 months of call record data which can be readily retrieved if requested.
2. Processes for data enrichment that facilitate identification of rural vs non-rural OCN's as well as the ability to provide the required delineation of call record data by call cause codes.
3. Processes to generate and submit the data in a format that meets the requirements of the FCC order.
4. Subject Matter Expertise to ensure that the above steps taken are accurate, appropriate and timely.

HOW TEOCO CAN HELP

In response to the FCC order, TEOCO has enabled our Analytics Solution to meet the needs of our customers by ensuring coverage both for regulatory reporting as well as in clients' vendor management and customer reporting obligations. Specifically, our Call Completion solution not only satisfies inherent reporting requirements, but also empowers our clients to understand and address root cause issues within its own network or pertinent to its vendors' networks.

TEOCO's Call Completion solutions utilize a combination of TEOCO Subject Matter Experts and a proven process and methodology for data acquisition. Our teams have in depth experience in gathering call detail record data and performing analysis to understand applicable enrichments and translations to enable transformation of the data into our industry leading Analytics Platform.

Call Completion requirements can be achieved through the intricate mapping of Call Detail Record (CDR) attributes such as Answer Type, Completion Code, and Disconnect Reason Code (or their equivalents) to TEOCO's normalized enrichment structure, which is used to calculate KPIs such as Answer Seizure Ratio (ASR) and Network Effectiveness Ratio (NER).

For illustrative purposes, below are examples of some of the outputs that can be generated using our Call Completion solution:

State	OCN	Answered Calls	Call Busy	Ring No Answer	Term Reject	Network Efficient	Seizure	ASR%	NER%
ME	OCNA	8,107	441	1,657	1	10,206	10,158	80%	100%
ME	OCNB	6,183	92	713	3	6,991	7,202	86%	97%
ME	OCNC	2,330	3	69	–	2,402	2,437	96%	99%
ME	OCND	2,777	32	303	2	3,114	3,182	87%	98%
ME	OCNE	10,677	203	2,266	1	13,147	14,831	72%	89%
ME	OCNF	11,106	308	1,687	–	13,101	15,342	72%	85%
ME	OCNG	29,374	988	3,517	153	34,032	35,283	83%	96%
ME	OCNH	127,751	6,914	7,059	2	141,726	153,136	83%	93%
ME	OCNI	17,769	748	4,397	6	22,920	29,781	60%	77%
ME	OCNJ	72,867	1,007	9,930	27	83,831	85,183	86%	98%
ME	OCNK	42,131	701	8,891	28	51,751	55,982	75%	92%
ME	OCNL	46,295	1,054	7,556	6	54,911	55,344	84%	99%
ME	OCNM	6,326	191	340	–	6,857	6,919	91%	99%
ME	OCNN	17,310	1,204	5,161	358	24,033	28,986	60%	83%
AZ	OCNO	42,701	1,011	14,307	28	58,047	61,486	69%	94%
AZ	OCNP	14,959	929	4,508	20	20,416	20,137	74%	101%
CA	OCNQ	29,137	2,133	3,356	11	34,637	41,330	70%	84%
KY	OCNR	1,193,616	59,535	62,629	31,526	1,347,306	1,476,049	81%	91%
MO	OCNS	11,537	647	1,093	93	13,370	15,075	77%	89%
MO	OCNT	113,523	5,569	4,725	22	123,839	125,419	91%	99%
AK	OCNU	504	43	35	–	582	618	82%	94%
Total		1,806,980	83,753	144,199	32,287	2,067,219	2,243,880	81%	92%

The table above is part of a larger nested output including Rural / Interstate, Rural / Intrastate, and Rural / Total views, with the following stacked ASR% / NER% values:

Rural / Interstate: 86% / 90%, 80% / 83%, 87% / 89%, 72% / 89%, 72% / 85%

Rural / Intrastate: 84% / 93%, 86% / 98%, 83% / 96%, 81% / 87%, 87% / 92%, 91% / 99%, 71% / 79%, 80% / 100%, 77% / 80%, 68% / 82%, 83% / 87%, 87% / 88%, 84% / 86%, 70% / 79%, 80% / 80%, 86% / 88%, 75% / 82%, 83% / 94%, 72% / 89%, 78% / 89%

Rural / Total: 86% / 97%, 96% / 99%, 87% / 98%, 72% / 89%, 72% / 85%, 83% / 96%, 83% / 93%, 89% / 90%, 87% / 98%, 71% / 79%, 77% / 95%, 68% / 82%, 83% / 95%, 87% / 98%, 0% / 0%, 82% / 94%

The TEOCO solution also incorporates the NECA Rural OCN list to denote rural vs. non-rural terminations in meeting the FCC reporting requirement. The net result is that TEOCO's Call Completion Analytics solution enables the reporting of KPIs across any enriched dimension of the call records including, but not limited to: state, OCN, vendor, customer, jurisdiction, and LEC.

Once accumulated, data can be stored to meet the retention requirements of the FCC, or longer based on customer business needs.

To learn more about how TEOCO can help you in meeting the FCC requirements, contact TEOCO at info@teoco.com

Standard Network Metrics

Mandatory Reporting Alignment

Industry Expertise

Pioneering Big Data Analytics Platform

Market Leading LCR

Analytics Platform + Intelligent Routing

To further enhance your focus on call quality and customer experience, TEOCO also offers our Acuité solution, an industry-leading routing solution which offers traditional Least Cost Routing.

Combined with the Analytic platform, Acuité leverages KPI and KQI information to make near real time routing decisions to ensure quality while increasing customer satisfaction and reducing churn.

About TEOCO

TEOCO is one of the leading providers of Service Assurance and Analytics solutions to communication service providers worldwide. TEOCO's product portfolio includes:

- **Margin Assurance** – Manage costs and revenues to understand the profitability of every transaction.

- **Customer Analytics** –Combine profitability, quality of experience, and behavioral data to better understand, target, and engage your subscriber base.

- **Network Optimization -** Analyze and Optimize radio access networks to reduce costs while improving coverage, capacity, and quality of the network

- **Service Assurance** – Resolve faults, maximize performance & utilization, and improve customer experience.