Network Data Collector – Revenue Assurance IDD
Interface Detailed Design

Revision	Description	Summary of Revisions	Initials	Release Date
0.1	Initial draft	Baseline	RSH	1/31/2017
1.0	Approved Baseline	Final Approval	RSH	3/24/2017
1.1	VoLTE Updates	ieCCF Failover Drop Codes	RSH	4/5/2017
1.2	Drop/Error	Explanatory text on use of drop and error codes	RSH	4/12/2017
1.2.0.1	Drop Code	SMS/MMS Archiving Drop Code	LS	5/12/2017
1.2.0.2	Drop Code	Negative Ring Time	BJ	6/27/2017
1.2.0.3	Drop Code	Missing GW IP Addrss	SN	10/31/2017

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1 Purpose

This document describes the artifacts provided by the NDC to the RA organization.

2 SDM Report

Within NDC, SDM records are produced throughout the ImE processing of charging records. Files containing these records are then pushed to **infoappprd:/users/ndc_app/transfer** every hour.

2.1 File Name

Files are named **sdm_out_YYYYMMDDhhmmss.txt.**

2.2 File Record Format

Each line in a file contains comma delimited text fields. The fields are described in the following table.

Field #	Field Name	Max Length	Value Type	Description
1.	MSG_TIME	17	MM/DD/YY hh:mm:ss	SDM Subsystem Field. Date and time the message was generated. Includes a space between the date and time.
2.	MSG_CODE	15	Text	SDM Subsystem Field. Message code to identify the type of message. This allows SDM to be used to process multiple types of messages for different purposes.
3.	MSG_PID	5	Text number	SDM Subsystem Field. Unix process ID of the task that generated the message.
4.	MSG_USER	30	Text	SDM Subsystem Field. User name of the process, typically “cgi”.
5.	MSG_PROC	30	Text	SDM Subsystem Field. Unix process name.
6.	MSG_NODE	30	Text	SDM Subsystem Field. Node on which the process was running.
7.	FILE_ID	24	Text	Matches UFF File Number, created from Intermediate master file name.
8.	DATE	8	YYYYMMDD	Master file creation date. YYYYMMDD
9.	REPROCESS_FLAG	1	0/1	Reprocess Flag (optional): 0 = initial file process run, default if not provided. 1 = reprocessed file.
10.	SOURCE_SYSTEM	15	<system>|<portal>	Originating input system and portal in Intermediate. 1-7 character system name, pipe ‘|’ delimiter, and 1-7 character portal name.
11.	OPERATION	15	Text	e.g. GDE for *guide*
12.	DESTINATION_SYS	15	<system>|<portal>	Output System and Portal in Intermediate. 1-7 character system name, pipe ‘|’ delimiter,

Field #	Field Name	Max Length	Value Type	Description
				and 1-7 character portal name.
13.	GROUPING_ID	15	Text	Name associated with GROUPING_VALUE
14.	GROUPING_VALUE	15	Text int	
15.	AUDIT_CATEGORY	2	<C><S>	Audit Category is a two character field. First character is: • 'I' = Input • 'O' = Output Second Character is: • 'I' = Input data records (input) • 'G' = Generated data records (input) • 'R' = Released records (input) • 'O' = Output records (output) • 'F' = Filtered records (output) • 'S' = Suspended records (output)
16.	RECORD_DISP	1	Text int	UFF Record Disposition • 0 = APRM • 1 = Call Dump • 2 = EPS
17.	RECORD_CODE	5	Text int	UFF Record code. See **Drop Reasons** in following table.
18.	SERVICE_TYPE	4	Text	UFF Service type. SMS, PSMS, ...
19.	VALUE_ID_1	15	Text	Name associated with VALUE_1
20.	VALUE_1	15	Text int	Integer value associated with VALUE_ID_1
21.	VALUE_UNIT_1	15	Text	Unit type (e.g. BYTES)
22.	VALUE_ID_2	15	Text	Name associated with VALUE_2
23.	VALUE_2	15	Text int	Integer value associated with VALUE_ID_2
24.	VALUE_UNIT_2	15	Text	Unit type
25.	VALUE_ID_3	15	Text	Name associated with VALUE_3
26.	VALUE_3	15	Text int	Integer value associated with VALUE_ID_3
27.	VALUE_UNIT_3	15	Text	Unit type (e.g. BYTES)
28.	VALUE_ID_4	15	Text	Name associated with VALUE_4
29.	VALUE_4	15	Text int	Integer value associated with VALUE_ID_4
30.	VALUE_UNIT_4	15	Text	Unit type

SDM Record Format

When a format or value is encountered which leads to an NDC processing failure but this processing failure is something that NDC considers repairable through future development changes, it is treated with an *error* code. An example might be a System ID from one of our subscribers in a foreign network that was not communicated properly to Intercarrier-Services. In this case, we provide an error that yields corrective action to repair a table with the new SID value. Once repair is effected, the error should disappear in future processing.

When NDC encounters an artifact in usage that indicates that the record should not be processed further, it is treated with a *drop* code. This is not something that can or even should be repaired. It is simply diverted from delivery to rating.

DROP_CODE	DROP_ABBREV_NAME	DROP_DESCRIPTION	DROP_CATEGORY D = “drop” E = ”error”
0	TOPS	Records sent to TOPS via other data type	D
10000	DUPL	Duplicate Records	D
10001	UF01	Format -Record Type	D
10002	UF02	Format -Service Type	D
10003	UF03	Format -Record sequence Number	D
10004	UF04	Format -File Number	D
10005	UF05	Format -Record Disposition	D
10006	UF06	Format -Record Code	D
10007	UF07	Format -Source System	D
10008	UF08	Format -Start Date	D
10009	UF09	Format -Start Time	D
10010	UF10	Format -Start TimeZone	D
10011	UF11	Format -Home Sid	D
10012	UF12	Format -Serve SID	D
10013	UF13	Format -Originating Cell Trunk	D
10014	UF14	Format -Terminating Cell Trunk	D
10015	UF15	Format -BSID	D
10016	UF16	Format -Carrier ID	D
10017	UF17	Format -Protocol	D
10018	UF18	Format -Event Type	D
10019	UF19	Format -Call Direction	D
10020	UF20	Format -Originating MSID	D
10021	UF21	Format -Identity	D
10022	UF22	Format -Originating MDN	D
10023	UF23	Format -Originating Address	D
10024	UF24	Format -Terminating MSID	D
10025	UF25	Format -Terminating Number	D
10026	UF26	Format -Dialed Digits	D
10027	UF27	Format -Terminating Address	D

10028	UF28	Format -Termination Code	D
10029	UF29	Format -Service Feature	D
10030	UF30	Format -Call Forwarding Indicator	D
10031	UF31	Format -Call Delivery Indicator	D
10032	UF32	Format -Call Waiting Indicator	D
10033	UF33	Format -3 way Calling Indicator	D
10034	UF34	Format -Call Answered Indicator	D
10035	UF35	Format -Ring Time	D
10036	UF36	Format -Call Duration	D
10037	UF37	Format -Roaming Indicator	D
10038	UF38	Format -Session ID	D
10039	UF39	Format -Session Type	D
10040	UF40	Format -Bytes In	D
10041	UF41	Format -Bytes Out	D
10042	UF42	Format -Application ID	D
10043	UF43	Format -Application Type	D
10044	UF44	Format -Application Name	D
10045	UF45	Format -Purchase Category Code	D
10046	UF46	Format -Application Description	D
10047	UF47	Format -Content Amount	D
10048	UF48	Format -Orig_trans_ID	D
10049	UF49	Format -Network Flag	D
10050	UF50	Format -Femto-cell-ringtime	D
10051	UF51	Format -Femto-cell-ringpluse	D
10052	UF52	Format -LTE Handoff	D
10053	UF53	Format -Market/Submarket	D
10054	UF54	Format -Originating IMSI	D
10055	UF55	Format -Adjustment Reason Code	D

10056	UF56	Format -Extrernal Reference ID	D
10057	UF57	Format -Partner ID	D
10058	UF58	Format -Campaign ID	D
10059	UF59	Format -Initiator Type	D
10060	UF60	Format -Initiator ID	D
10100	NOMD	MDN not found	D
10101	NOMI	MIN not found	D
10102	NTYP	Unsupported Record Type	D
10103	NBIL	Non billable Record types	D
10104	NTRM	Unsuccessful termination	D
10105	PPD	Prepaid	D
10106	INPT	Postpay Incoming Messages	D
10107	0BYT	Bytes In/Out total zero	D
10108	LBYT	Bytes In/Out < minimum	D
10109	FOCA	Free of Charge Application	D
10110	FOC2	2 Usage for MMS	D
10111	FOC3	3 Usage for MCB	D
10112	FOC4	4 Usage for BREW	D
10113	FOC5	5 Usage for FOTA	D
10114	FOC6	6 Usage for DNS	D
10115	FOC7	7 Usage for Synchronous	D
10116	RBSB	pSMS Ringback subscriptions	D
10117	EQNM	Originating MSID = Terminating_MSID	D
10118	NANS	Call Not answered	D
10119	LTL	Land to Land calls without CFW/CDL	D
10120	0DUR	Mobile to Mobile with 0 duration	D
10121	ISH	Orig or Term Intersystem Handoff	D
10122	FAIL	Cellsite Failure (completion 06)	D
10123	NREG	Unregistered Mobile (treatment 069)	D
10124	NSIG	Signal lost during call (completion 04)	D

10125	INVD	Invalid event_info_digit on NTI Rec	D
10126	ARIS	AERIS phone	D
10127	UPS	UPS Calls with NPA	D
10128	RPS	RPS Records	D
10129	VM	Voice Mail Calls	D
10130	UMP	Usage Market Policy Drop	D
10131	KILL	APLX Kill Calls (Feature 307)	D
10132	TEST	APLX Mobile Station Test (Feature 104)	D
10133	BADC	APLX Incorrectly populated CDR hex_id = AA	D
10134	EMPB	Employee Brew Records	D
10135	MSMT	Mobile terminated message with MSID that does not match ECS	D
10136	MSMO	Mobile originated message with MSID that does not match ECS	D
10137	TOMT	Mobile terminated message that timed out with no matching ECS record	D
10138	TOMO	Mobile originated message that timed out with no matching ECS record	D
10139	NANV	Incomplete calls with Verizon NPA	D
10140	GRNG	Group Ringing	D
10141	CANT	CANTEL accidental drop	D
10142	BLSK	BillShock MO SMS Messages	D
10143	RMSP	Roamer Support Call	D
10144	UBLR	Unbillable Roamer	D
10145	NO60	Unanswered calls with >59 sec ringtime	D
10146	CLLI	Mobile originated with no orig CLLI or Mobile terminated with no term CLLI	D
10147	OOTB	Out of the box	D

		unprogrammed handset orginating MDN = last 4 digits of ESN	
10148	PPMM	Mismatch between MIN_LR NPA_TYPE and Qualcomm Prepay Flag	D
10149	OLDR	Record older than 30 days	D
10150	GIRO	GSM Intl Roaming SMS MO	D
10151	GIRN	GSM Intl Roaming SMS Notifications	D
10152	NLTE	Not LTE	D
10153	C911	Drop 911 calls	D
10154	NTLU	Intraco Not Total Usage Filter	D
10155	IMRN	IMS Routing Number	D
10156	IINC	ieCCF Incomplete (ieCCF failover)	D
10157	IPAR	ieCCF Partial (long duration VoLTE call)	D
10158	VCDM	VCDMA TAS Record	D
10159	MS3P	Message Archiving	D
10160	RTL0	Ring Time LT 0	D
10161	MQCI	SGW record missing QCI	D
10162	V911	VoLTE E-911 Record	D
10163	MSPA	Missing SGW or PGW IPv4 Address	D
11000	HREC	Header records	D
12000	TREC	Trailer records	D
20000	NFTY	Record type not found	E
20001	NFTZ	Failure to lookup timezone	E
20002	NFDS	Failure to lookup ID in ADS	E
20003	NFRS	Failure to lookup source system	E
20004	NFMD	Failure to retrieve data from MDN	E
20005	NFID	Failure to retrieve data from DATA_APP_ID	E
20006	NFDR	Failure to retrieve data from DROP_REASONS	E
20007	NFMF	Failure to retrieve data from MAF_FACTS	E

20008	NFRT	Failure to retrieve data from ROUTE	E
20009	NFLR	Failure to retrieve data from MIN_LR	E
20010	NFSD	Failure to retrieve data from SID	E
20011	NFUP	Failure to retrieve data from USAGE_POLICY	E
20012	NFCI	Failure to lookup Carrier_id_mapping_tbl	E
20013	NFAI	Failure to lookup brew_app_item_table	E
20015	NFBS	Failure to lookup Bsid to Serve Sid mapping	E
20016	NFBT	Failure to lookup Bsid Type	E
20017	NFTD	Cannot find TADIG value in Reference Table usc_plmn_to_tadig_tbl	E
20018	NFCP	Cannot find COMPANY value in Reference Table usc_sid_to_company_tbl	E
20019	NFPM	Cannot find PLMN value in Reference Table usc_tadig_to_plmn_tbl	E
20020	NFSG	Cannot find SGSN Address in Reference Table sgsn_to_sid_tbl	E
30000	BLTE	Temporary Drop for billable LTE usage	D

Drop Reasons

3 A&F Report

The A&F report is produced each week (Monday morning delivery) and shows counts of UFF records that are delivered from NDC to the A&F server for each network appliance that produces charging records.

3.1 File Name

The A&F report is a CSV spreadsheet titled **AUTO_ANF_REPORT_MM-DD-YYYY** and delivered via e-mail. The report is actually delivered by A&F and not NDC but does reflect those UFF records delivered by NDC to A&F.

3.2 File Format

Field #	Field Name	Max Length	Value Type	Description
1.	SWITCH	10	Text	This is the abbreviated name of the network appliance that produced the material from which a UFF record is produced. These appliances are listed in the lower table.
2.	DATE	8	Date	YYYYMMDD
3.	COUNTS	10	Integer	Number of UFF files delivered on this date.
4.	IN_REC	16	Integer	Records directly extracted from the network appliance
5.	GEN_REC	16	Integer	Records generated by NDC based upon material extracted from the network appliance
6.	DROP_REC	16	Integer	Records that were dropped by NDC. See previous section regarding NDC drop reasons.

Appliance	Description
AAA1	3G and 2.5G (1X-RTT) usage from SCH AAA 1-12 and KNX AAA 1-12
APPL	2G circuit switch usage from Appleton Wisconsin VLR
ASHE	2G circuit switch usage from Asheville North Carolina VLR
CDR2	2G circuit switch usage from Cedar Rapids Iowa VLR
CLIN	2G circuit switch usage from Clinton North Carolina VLR
COLU	2G circuit switch usage from Columbia Missouri VLR
CONG	2G circuit switch usage from Congress Park New Hampshire VLR
EURE	2G circuit switch usage from Eureka California VLR
GRAN	2G circuit switch usage from Granite Hill Maine VLR
GREE	2G circuit switch usage from Greenville North Carolina VLR
GSMD	3G (GPRS) and 2.5G (EDGE) usage from GGSN
GSMS	2G (GSM) message origination usage from financial clearing house (TAPIN)
GSMT	2G (GSM) message termination usage from financial clearing house (TAPIN)
GSMV	2G (GSM) circuit switch usage from financial clearing house (TAPIN)
JOHN	2G circuit switch usage from Johnston Iowa VLR
JOPL	2G circuit switch usage from Joplin Missouri VLR
KNOX	2G circuit switch usage from Knoxville Tennessee VLR
LLYN	2G circuit switch usage from Lynchburg Virginia VLR
LROE	2G circuit switch usage from Roanoke Virginia VLR
MADI	2G circuit switch usage from Madison Wisconsin VLR
MEDF	2G circuit switch usage from Medford Oregon VLR
MORG	2G circuit switch usage from Morgantown Maryland VLR
MOT	2G message usage from Motorola SMSC
NEWB	2G circuit switch usage from New Berlin Wisconsin VLR
OKLA	2G circuit switch usage from Oklahoma City Oklahoma VLR
OMAH	2G circuit switch usage from Omaha Nebraska VLR
OWAS	2G circuit switch usage from Owasso Oklahoma VLR

PEO2	2G circuit switch usage from Peoria Illinois VLR
PGW1	4G usage from Knoxville and Schaumburg PGW
PMG1	MMS usage including media beside text
PTX1	MMS usage with text only
ROC2	2G circuit switch usage from Rockford Illinois VLR
SALI	2G circuit switch usage from Salina Kansas VLR
TAS1	4G packet switch (voice) usage from TAS
VALI	Usage from Valista
YAKI	2G circuit switch usage from Yakima Washington VLR

4 NOC PGW Report

The NOC PGW report summarizes 4G best-effort usage for home subscribers over the past year.

4.1 File Name

The NOC PGW report is a CSV spreadsheet titled **noc_pgw_MM-YYYYMMDD** and delivered daily via e-mail.

4.2 File Format

Field #	Field Name	Max Length	Value Type	Description
1.	DATE	8	Date	YYYYMMDD
2.	Input Records	16	Integer	Number of CDRs produced by the PGWs.
3.	Prepaid Records	16	Integer	Number of field 2 that are prepaid.
4.	% of Total	6	Float	Percentage of field 2 that is prepaid.
5.	PREPAID_RG0_VOLUME	24	Integer	Total bytes produced by the PGWs in Rating Group 0 (comprehensive) for prepaid.
6.	Prepaid Billable	24	Integer	Number of field 3 that have amounts in Rating Group 1 (billable)
7.	PREPAID_RG1_VOLUME	24	Integer	Total bytes in field 5 that are in Rating Group 1 (billable)
8.	Prepaid FOC	24	Integer	Number of field 3 that have amounts in Rating Group 2 (zero-rate)
9.	PREPAID_RG2_VOLUME	24	Integer	Total bytes in field 5 that are in Rating Group 2 (zero-rate)
10.	Postpaid Records	16	Integer	Number of field 2 that are postpaid.
11.	% of Total	6	Float	Percentage of field 2 that is postpaid.
12.	POSTPAID_RG0_VOLUME	24	Integer	Total bytes produced by the PGWs in Rating Group 0 (comprehensive) for postpaid
13.	POSTPAID_with FOC BYTES	24	Integer	Number of field 10 that have amounts in Rating Group 1 (zero-rate)

Field #	Field Name	Max Length	Value Type	Description
14.	PREPAID_RG1_VOLUME	24	Integer	Total bytes in field 12 that are in Rating Group 1 (zero-rate)
15.	POSTPAID_with BILLABLE BYTES	24	Integer	Number of field 10 that have amounts in Rating Group 2 (billable)
16.	% of Total	24	Float	Percentage of field 2 that contains postpaid billable records.
17.	POSTPAID_RG2_VOLUME	24	Integer	Total bytes in field 12 that are in Rating Group 2 (billable)
18.	POSTPAID_RG1_ZERO VOLUME	24	Integer	Number of field 10 that contains no Rating Group 1 volume
19.	POSTPAID_RG2_LT_1K VOLUME	24	Integer	Number of field 10 that contains Rating Group 2 (billable) volumes that total less than 1K bytes
20.	% of Postpaid DROP < 1K	6	Float	Percentage of 10 that contains Rating Group 2 (billable) volumes that total less than 1K bytes

5 GSM TAP Month Report

The GSM TAP Month Report summarizes usage of US Cellular subscribers in GSM roaming environments for circuit-switch voice as well as SMS services. This usage is communicated back to US Cellular in TAP format from the financial clearing house that mediates between US Cellular and GSM network providers.

5.1 File Name

The GSM TAP Month Report is titled **Daily GSM Tap Month Report** and delivered daily via e-mail.

5.2 File Format

Note that this is a pipe ('|') delimited file.

Field #	Field Name	Max Length	Value Type	Description
1.	Input Portal	8	Text	The NDC input portal defined to receive TAP files for GSM usage.
2.	Period	16	Date	MM/DD/YY – MM/DD/YY
3.	Total Files	10	Integer	Number of files received on the input portal for the given period.
4.	Total Records	16	Integer	Number of TAP records contained in the received files.
5.	Daily Average	16	Integer	Field 4 divided by field 3, rounded to integer
6.	First Data Time	16	Date	MM/DD/YY HH:MM:SS
7.	Last Data Time	16	Date	MM/DD/YY HH:MM:SS

6 Voice Trends Report

The Voice Trends Report shows the call originations of the top 10 MDNs for a given date on a particular VLR.

6.1 File Name

The Voice Trends Report is titled **<YYYYMMDD> Voice Trends** and delivered daily via e-mail.

6.2 File Format

The report segregates each reporting VLR for the given date. The VLR names are as shown in the A&F report for the 2G circuit-switch appliances.

Field #	Field Name	Max Length	Value Type	Description
1.	Caller	10	TBCD	The originating MDN.
2.	Count	8	Integer	Origination frequency

Certain use cases result in high call volumes but do not contain an originating MDN that is valid. For example:

1. Calls to *ACT (*228) where a new MDN is being provisioned.
2. Calls that do not get answered (ring-no-answer).

These use cases are summarized separately in the report.

7 References

7.1 Glossary

A&F	Acquisition and Formatting
AAA	Authentication, Authorization and Accounting
APRM	Amdocs Preferred Roaming Manager
CDR	Charging Detail Record
EDGE	Enhanced Data rates for GSM Evolution
EPS	Error Processing System
GGSN	Global GPRS Service Node
GPRS	General Packet Radio Service
GSM	Group Special Mobile
ieCCF	Charging Collection Function
IME	Inter MEdiate
MMS	Multimedia Message Service
NDC	Network Data Collector
PDC	Provisioning and Data Collection
PGW	Packet data network GateWay
RA	Revenue Assurance
SDM	Statistical Data Messages
SID	System ID
SMSC	Short Message Service Controller

TAP	Transfer Account Procedure
TAS	Telephony Application Server
TBCD	Telephony Binary Coded Decimal
UFF	Universal File Format
VCDMA	VoLTE CDMA Fallback
VoLTE	Voice over LTE
VLR	Visited Location Register