

Call Detail Reporting Guide

For AltiWare Open Edition (OE) 4.0

AltiGen Communications

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1. Introduction to Call Detail Recording

This document covers AltiGen's Call Detail Recording (CDR) solutions including data creation, recording, collection, and reporting. Two topics receiving special consideration are the External Logger Service and the structure of the AltiWare CDR record. While AltiGen's CDR can be used for individual and departmental billing, timecards, and market analysis, this document places special emphasis on its use for call center applications.

1.1 CDR Applications

The AltiGen Call Detail Recording database and the TriVium CallAnalyst Reporting program combine to provide both general and custom data analysis and reporting opportunities. The range of reports and the data schema were designed to provide information for PBX, call center, billing, multi-tenant, and performance tracking information.

Analyzing the call traffic in customer service systems can be taken to quite detailed lengths. Managers may want to look into how each general call handling process is managed, on average, so that they may uncover specific operational areas that may be improved. For example, the manager may find that certain types of calls are spending a great deal of processing time in the Auto Attendant handling, and therefore decide to change either how many calls are sent to an Auto Attendant, or shorten the number of options given to the caller.

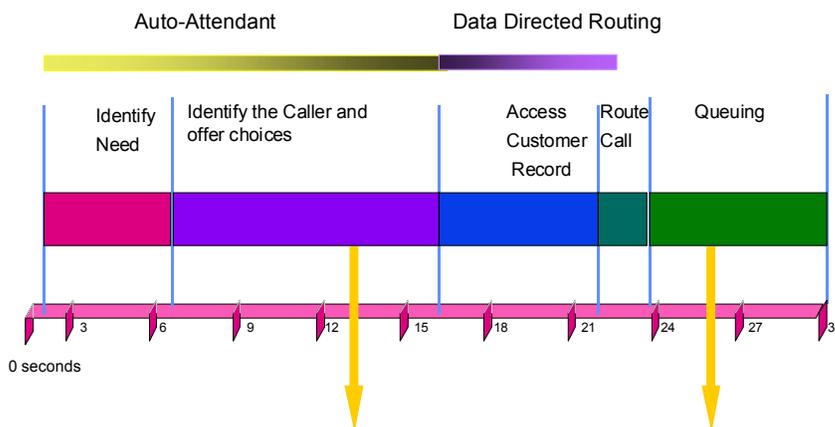
PBX and billing reports are needed for example to keep costs down while providing adequate phone line (trunk) facilities to keep the business going. Call Detail Records and associated reporting packages make these assessments possible.

Call Center applications show the rich amount of information contained in the CDR database since there are so many call scenarios and outcomes involved with customer service applications. Therefore, looking the CDR record from a call center perspective may provide an explanation on why the CDR record has so much information.

1.2 Call Center Events and CDR

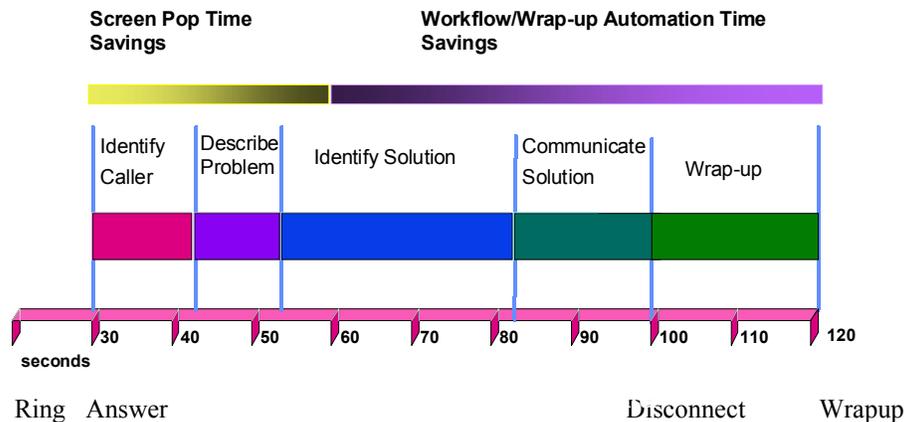
The objectives of call processing in call center operations is to provide the right resources for a given caller and track the time and outcome of the call as well as the performance of the service agent. Many scenarios are possible, the general model is shown here:

Determining what resource can assist the caller:



A call starts with auto-attendant answer. The auto-attendant offers callers routing choices, and/or collects information to help intelligently route a call. Queuing, if it happens at all, starts with the call leaving the auto attendant, and ends when the agent answers the phone. Queuing includes ring time of the agent phone. Disconnects (call abandons) can happen at any time during the process. So a manager will want to track when a call started, how long it spent in auto-attendant, and how long it remained in queue. From a marketing perspective, the manager may also want to know where the call came from and when.

Determining how to maximize the experience and minimize the time spent:



All of this activity is summarized under talk time and wrap-up time. Call transaction information can be stored, after wrap-up, with the CDR record, using AltiGen’s AltiX, an ActiveX control using AltiGen’s AltiLinkPlus CTI link.

As a consequence of these call processing steps, AltiGen’s CDR database contains, for example, data on a call’s start and end times, AutoAttendant duration, work group assignment, queuing duration, talk time, wrap-up time, voice message duration, and optionally call-associated data (User Defined Data).

1.3 Management Objectives

CDR and reporting packages help managers get the most out of their PBX and call center phone systems. Knowing the timing of each step may lead to any of the following managerial actions:

Improving Quality of Service

- Add more incoming phone lines or trunks so customer service increases and fewer callers hear busy signals. Find the busiest routes.
- Add, shorten, or improve automated routing and service options (improved AutoAttendant options)
- Add call routing applications to better route calls to agents with specific skills
- Add more agents to service calling customers and thereby shorten the waiting time and lower long-distance charges.
- Shorten the queuing time during the busy hour by adding more agents, possibly remote agents
- Measure the service level of each workgroup and see if shifting agents benefits quality or lowers costs
- Find the agents with the greatest call successes and measure how long they talk to customers. Use these agents as models for other agents to learn from and emulate.

Making or Saving Money

- Determine if agents are spending too much time in discussion or in wrap-up; provide them better PC support programs and/or give them better training. Are some agents too slow at finishing up from the last call? Are all agents suffering from poor desktop applications? Who is slow, who is fast?
- Determine how often you transfer calls? Improve the routing decisions if necessary.
- Measure the number of calls and duration by carrier. Bill back costs to departments or tenants.
- Determine if some trunks (lines) are not working – no traffic or short holding times.
- Analyze the geographic spread of incoming calls to determine marketing and support strategies.
- Look for nuisance calls from specific ANI sources.
- Determine if some offered services (DNIS) are not being sufficiently used.
- Track when agents sign-on and sign-off. Feed the information to payroll. Plan schedules.

2.0 AltiGen's Reporting Solutions

To find information to assist in the assessment of the decisions and views, AltiGen has worked with third parties to provide reports that cover most of these topics.

Reporting packages examine the CDR records and create summary statistics and graphical displays useful to the phone system manager.

2.1 Bundled Reporting Solution

AltiGen and TriVium Systems signed an agreement whereby TriVium provides AltiGen a reporting product under a new release of their Call Analyst product. AltiGen bundles this TriVium Call Analyst product in with its shipment of AltiGen's AltiWare OE 4.0 product. The Call Analyst has both basic and advanced reporting capabilities. Basic reports are offered as part of the AltiWare OE 4.0 product. There is also a fully working copy of the **advance** reports available for a free thirty-day trial, after which you must call TriVium to purchase a license to continue using the advanced reports, which are focused primarily on aspects of call center applications.

2.2 Reports Available with OE 4.0 via TriVium Call Analyst

Examples of the most general categories of reports using AltiGen CDR data are:

Basic Reports

- Calling by day, day of week, hour of day
- Calling by trunk by day ...
- Calling by extensions, by trunks
- Calling costs by extensions
- Calling by account codes and duration
- Most frequent calls, longest calls, most expensive calls
- Calling by area codes
- Calling by country codes
- Rate tables by state and by country
- Inbound Trunks
- Outbound Trunks
- Short Calls
- OutCall Routing
- Area Codes - Inbound

- Area Codes - Outbound
- Tenant OutCalls
- Account Code OutCalls
- AutoAttendant View
- Agent SignOn
- Carriers
- Routes
- Number of Calls Received - ANI
- Number of Calls Received - DNIS
- Number of Calls Received - Extension#

Advanced Reports

- Inbound Calls by Time
- Inbound Calls by DNIS
- Inbound Calls by WorkGroup
- Agent View within WorkGroup
- Agent View
- WorkGroup Service View
- Web Calls
- VoiceMail Spillover View

For example, the following reports are a) show trunk usage, and b) show the performance of service agents.

Inbound Trunk Type View

Date: 07/17/2000 - 24 Hour Period : Number of Calls by Quarter Hour

	Analog	T1	PRI	IP	Total
00:00 – 00:15	xxxx	xxxx	xxxx	xxxx	xxxxx
00:15 – 00:30	xxxx	xxxx	xxxx	xxxx	xxxxx
00:30 – 00:45	xxxx	xxxx	xxxx	xxxx	xxxxx
00:45 – 01:00 am	xxxx	xxxx	xxxx	xxxx	xxxxx
01:00 – 01:15	xxxx	xxxx	xxxx	xxxx	xxxx
*					
23:34 – 00:00 pm	xxxx	xxxx	xxxx	xxxx	xxxx
Total Calls	100	1000	1874	550	3524

Agent View Within Work Group

Date: 07/17/2000 - 24 Hour Period

For WorkGroup XX: User entered

Agent	Number of Calls					Average Duration			
	Total	HandledWG	Transfer'd	RNA	Outbound	InWG	Talk	WrapUp	Outb
Ext	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00
Ext	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00
Ext									
*									
Ext	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00

2.3 Call Detail Recording - Past and Present

AltiGen Communications has redesigned its CDR (Call Detail Recording) database in Release 4.0. It is entirely different than prior releases, and the data schema for the database is provided below.

The objective of the new CDR database schema is to provide rich, accurate information covering different viewpoints of the AltiServ system: incoming calls, outgoing calls, agents, workgroups, tenant use, billing, account tracking, and other metric perspectives. Not all views will be of interest to you. Hopefully, we have covered enough information for most of your objectives.

AltiWare 4.0 does not support rate tables unlike past releases. This function must now be obtained by external applications found in reporting tools, such as the TriVium Call Analyst. The CDR database has sufficient information to support rate and charge evaluation by external applications.

2.4 No OE 3.5 Migration Path

AltiGen customers using AltiGen's 4.0 CDR will not be provided with any conversion tool for CDR records stored under OE 3.5 or prior releases. Therefore, it is important that your dealer copy and save all CDR (.dbf) files from a prior release before installing OE 4.0. Consider OE 4.0 and any supporting report program as a fresh start. If you have a reporting package using AltiGen's CDR or SMDR, then the reporting package vendor will have to rewrite the reporting program to work with the new CDR database schema.

2.4 No Reporting of Extension to Extension Calls

AltiWare 4.0 does not support reporting CDR records for internal calls between extensions, or from internal extensions to workgroups. The CDR database only has information on calls entering or leaving the phone system via a trunk.

2.5 Cautions Concerning SMDR

SMDR is a Mitel-defined data schema for delivering basic call information out the RS232 serial port to external recording and reporting applications. While AltiGen has provided an SMDR interface, it has had many problems in terms of accuracy and consistency of information delivery. SMDR is NOT CDR. CDR is historical, and is a database containing call records. SMDR is a real time delivery of a subset of this information. AltiGen recommends that customers use the new CDR, not the SMDR, for reporting and billing applications. No improvements or corrections have been made to SMDR.

2.6 Real Time and Centralized CDR Applications

AltiGen's OE 4.0 provides a new means for receiving CDR information from AltiWare in a real time manner. AltiWare OE 4.0 comes with a software program found in the External Logger Service directory on the OE 4.0 CDROM.

A separate server is required to use the External Logger Service. Basically, AltiWare OE 4.0 sends its CDR records in real time (behaving as a client) to the External Logger Server over TCP/IP. On a separate server, the External Logger Service receives the CDR record and writes the CDR record into a Microsoft SQL 7.0 database. Hence the records in this SQL database are constantly being updated with the latest information.

You must purchase and install MicroSoft's SQL 7 data base server software. Using the AltiGen provided External Logger Service program, you can achieve a centralized repository for all CDR records coming from one or more AltiServ systems. This is centralized CDR. Each AltiServ system records its node id in all the records it sends to the External Logger Service. Up to two separate central repositories can also be supported, one for an SQL 7 database if desired, and one for the TriVium reporting package.

TriVium is using a *customized version* of the External Logger Service, to centralize the CDR records for one or more AltiServ systems. This is a special case of a partnership. AltiGen generally will only support the MS SQL 7.0 or MS SQL 2000 database application users and TriVium.

3. 0 Backing Up and Installing AltiWare's CDR records

As in the past, AltiWare users can simply enter the AltiServ system via Windows on the server, and copy the AltiWare CDR database file (altiserv/db/icc_cdr.dbf) file to the same file name in an alternative location. Then you can open the .dbf file using MicroSoft's Excel or any other program supporting .dbf file format. From Excel, you can save the file to any of the other types supported by Excel, including comma delimited text file.

The benefits of this method are its simplicity and speed of examining the data.

The liabilities of this method are:

It requires you to directly access the AltiServ system while it is servicing calls.

The use of Excel may be adequate for you, but it does not provide the reports found in the bundled solution. It does not permit reasonable consolidation of multi-site CDR data, though with real work you can combine multiple Excel spreadsheets into one. The raw CDR data does not contain statistical elements found in reporting packages: counts, sums, averages, and certain statistical measures such as ASA and service levels. Most of all – the entire database must be copied. AltiWare keeps track of all calls entering the system since the last record over-written in the database. That is, the database is one large file buffer, keeping an enormous number of call records in proportion to the allocated disk space for this file, which for most customers can be up to 60 days of calls. Hence copying this large file to examine the last few days of call traffic seems somewhat awkward. When you use the External Logger Service, the reporting tool can manage its own file sizes and time span of interest.

4.0 External Logger Service

Quick Overview: The External Logger Service program is installed in the following manner →

- 1) You, or your dealer, obtain the AltiWare OE 4.0 CDROM.
- 2) The CDROM is placed into the target server CDROM drive, and examined through Windows Explorer or similar mechanism. Find the *External Logger Service* directory and find the setup file.
- 3) Running setup, the External Logger Service install program will first look for, configure, and install the External Logger Service and configure the CDR data schema into the MSQ7 database service.
- 4) After starting the ELS, and after configuring the AltiWare external CDR options, the AltiServ system begins delivering CDR records and the Logger Service writes these records into the MSQ7 database.

4.1 External CDR Logger Installation Guide

AltiWare OE 4.0 allows you to output call accounting data to an external database. The following items summarize the software implementation:

- Currently the external CDR logger only works with Microsoft SQL7. SQL7 and AltiWare can't be on the same server (software conflicts will occur).
- If you see an ODBC Driver Manager error message during AltiWare installation, select "OK" to overwrite the ODBC32.dll.
- System integrators or developers need to write custom query programs to extract data from the SQL server. AltiGen only provides the logging service.
- Multiple AltiServ systems can send CDR records to a single common SQL server for call reporting or billing purposes.

4.2 Installing External CDR Logger Service to SQL Server

Run the External Logger Setup from AltiWare OE 4.0 CDROM. During the setup process, the following dialog box will come up. You need to set these parameters properly.

SQL Server – Enter the computer name of the SQL server.

SA Name -- Enter the SQL System Administrator login name. Since "sa" is one of the system administrator accounts created by SQL installation, we will use this account as our example.

SA Password – Enter the SQL System Administrator password.

Database Name – Enter the name of the database for CDR logging. If you use the default, the installation process will create a database called "calldb".

DB Device Drive – This is the drive in which the calldb database will be created. This installation program will create the calldb database under the root directory of the drive letter you specify. You can not enter any sub-directory in this field. If you want to change the calldb database location, use the SQL server management utility to relocate the calldb database.

DataDevice Size – Enter the size you wish to allocate for the calldb database. To estimate the size, use the following equation:

Months of records you wish to keep: {M = months} (22 working days per month)

Average call volume per day {Call = inbound and outbound}; (Each call record is about 1kbyte in size.)

Database Size (MB) = (M*22*Call*1kbyte)/1024

LogDevice Size – Enter the size for the log file. Typically this is the same size as the database file.

4.3 Set-up the Logger and WatchDog Services

After re-booting the SQL server, you need to verify the following services:

Logger Server service is started, type is "Manual".

Logger Watchdog service is started. Startup type is "Automatic." The Watchdog service will check the status of the logger service every 15 minutes. If it detects that the logger service is not functioning, it will try to start the logger service automatically.

4.4 Activate External CDR Logging in AltiWare.

- 1) Do not do this step before the external logger in SQL is ready to receive data).
- 2) Go to System Configuration = Call Reports to check "Enable External Log".
- 3) Enter the IP address of SQL server and click on the apply button. You don't need to change the buffer size. Default 500 records means that the system will buffer 500 calls in memory, totaling about 500KB. Typically 500 should be good enough to accommodate most situations, unless you have a very busy LAN/Network connection between AltiServ and SQL Server.

4.5 Verify SQL Logging Activity

- 1) Make several connected outbound calls.
- 2) Open Query Analyzer form SQL7.
- 3) Type a query script "select" from "CallININFO" which will query against the CallInfo table. You should see the CDR records show up in the query results window.

4.6 SQL Backup and Maintenance

AltiGen does not provide any SQL backup and restore utilities. We strongly recommend that you use the SQL Backup and Maintenance utility to perform daily backup and maintenance jobs; and use the restore utility to restore tables to the database. If you need to reconstruct the SQL server, run External Logger Setup to create an empty calldb database before restoring the tables.

5.0 Call Detail Reporting Data Schema

This section contains:

- (1) **Data Schema**, indicating the CDR format supported by AltiGen's AltiWare OE4.0/Call Center software release, and defining different database elements (e.g. trunking, first/second party call answering, time stamps etc.).
- (2) **How system configuration affects CDR data.**
- (3) **Example Call Sequences** and the resulting placement of CDR information.
- (4) **Glossary of terms** used in the data schema and in reporting.

CDR Data Schema

Database Element	Definition	Type	Range and data source
Node ID	Unique server node ID	ULONG	1 –100 : Assigned to an AltiServ System in the AltiAdmin Client under -
Session ID Number	Unique session ID on the source Node	ULONG	A unique number, usually 9 digits or larger, assigned by AltiWare to a call.
Link Session Node ID	Reserved	ULONG	
Link Session ID Num	Reserved	ULONG	
MoreThan2WG	A flag that shows if a call used more than 2 workgroups during call handling	UBYTE	1 – more than two parties spoke with the caller 0 – two or less parties spoke with the caller. A party is an extension or tie trunk.
Transfer Trunk Number	The phone number to which a call was transferred outside the system; otherwise, it is empty. This field is used to show “hop-off” calls as well (IP tie trunks to hop off calls on remote systems).	UCHAR (41)	Target extension phone number, or up to an 11-digit number if the phone number is an off-net PSTN phone number type.
Trunks Section			
Trunk Direction	Shows whether this call record is for an inbound or outbound call type	UBYTE	0 – None (logon/off) 2– Incoming 4 – Outgoing
Remote System Trunk ID	Reserved	UCHAR (16)	
Trunk Remote Number	<ol style="list-style-type: none"> 1. Trunk destination number for outgoing call 2. Caller ID (ANI) for incoming call 3. IP address of far-end system for both incoming and outgoing call 	UCHAR (41)	Target extension phone number at the far end, or up to an 11-digit number if the phone number is an off-net PSTN phone number type .
Reserved Field		UCHAR (21)	
DNIS Number	DNIS number user dialed. This is the number the caller dialed.	UCHAR (41)	The extension number part of the DNIS number of in incoming call as determined by the customer and configured at central office switch.
Trunk Type	Type of trunk	UBYTE	1 – ANALOG 2 – T1 4 – IP 8 – PRI

Trunk Route	Out call route table name an outgoing call has taken	UCHAR (31)	A name defined in AltWare via AltAdmin screens in Outcall Routing.
Trunk Overflow Route 1	Overflow out call route	UCHAR (31)	A name defined in AltWare via AltAdmin screens in Outcall Routing.
Trunk Overflow Route 2	Overflow out call route	UCHAR (31)	A name defined in AltWare via AltAdmin screens in Outcall Routing.
Trunk Tenant	Trunk's tenant name	UCHAR (31)	A name defined in AltWare via AltAdmin screens in the trunk (lines or channels) configuration tables.
Account Code Dialed by Internal Caller	Account code of outgoing call if the caller decided to dial an account code	UCHAR (11)	0-11 digits long.
Auto Attendant Table Name	Auto attendant table name	UCHAR (33)	A name assigned to an auto attendant table in AltWare, AltAdmin in the attendant table.
Trunk PAD	Physical Address of the trunk device.	UCHAR (5)	A string represent the board number and the channel number on a board: e.g. 0102
First Answering Party			
Party1Reserved1	Reserved	UCHAR (16)	
Party1Number	Extension Number	UCHAR (21)	For non-workgroup calls, party1 is always set, even if the extension doesn't answer the call. For workgroup calls, if the call is answered, then the Party's number is in this field; if multiple agents were rung, then this is the last agent phone number that answered, otherwise it is empty.
Party1Reserved2	Reserved	UCHAR (21)	
Party1Type	Identifies type of extension	UBYTE	01 – Analog , 02 – IP, 04 – Wireless
Party1Pad	Physical address of the extension	UCHAR (5)	A string represent the board number and the channel number on a board: e.g. 0102
Party1WGNumber	Workgroup number the caller reached	UCHAR (21)	Workgroup numbers are extension numbers representing a group of agent extensions. Hence, it is an extension number.
Party1WGQueuingTime	Timestamp as to when call entered a queue for this workgroup number	ULONG	The timestamp is the number of seconds off-set from June 1970 to the present, where present represent the time call entered the queue.
Party1WGAnswerTime	Timestamp as to when an agent or extension answered the call	ULONG	The timestamp is the number of seconds off-set from June 1970 to the present, where present represent the time call was connected to AND answered by an extension or trunk.

Party1WGEndServiceTime	Timestamp as to when Party1 disconnects the call or trunk disconnection is detected. If a call is parked, this time stamp indicates when the call is picked-up by another extension.	ULONG	The timestamp is the number of seconds off-set from June 1970 to the present, where present represent the time call was transferred to another extension, trunk, AutoAttendant, voicemail box, or tie trunk OR simply disconnected.
Party1WGWaitDuration	Duration (in seconds) of a call in the queuing state. The value is Party1 workgroup Answer Time – Party1WGQueuing time	ULONG	The time in minutes: seconds that a call was in queue AND ringing a target connection until answered. If a call did not queue, but the available agent did not answer the phone, then WaitDuration will contain the time spent by the caller listening to the ringing phone!
Party1WGHandleDuration	Duration (in seconds) of the time a call has been connected to an agent	ULONG	The time in minutes: seconds that a call was in connection with a target device or service represented by Party1Number.
Party1Tenant	Extension's tenant name	UCHAR (31)	A name defined in AltWare via AltAdmin screens in the extension table.
Party1LogoffReasonCode	Logoff reason code if this is an agent logoff record. See ExitState	UBYTE	A number from 0-255 that was entered by an agent using the Center 4.0 AltAgent client screen.
Party1Reserve3	Reserved	UBYTE	
Party1Reserve4	Reserved	UBYTE	

Second Answer Party definitions are similar.

<i>Second Answering Party</i>			
Party2Reserve1	Reserved	UCHAR (16)	
Party2Number	Extension number	UCHAR (21)	
Party2Reserve2	Reserved	UCHAR (21)	
Party2Type	Identifies type of extension	UBYTE	1 – Analog 2 – IP 4 – Wireless
Party2Pad	Physical address of the extension or trunk	UCHAR (5)	
Party2WGNumber	Workgroup number that the call being transferred	UCHAR (21)	
Party2WGQueuingTime	Timestamp as to when call entered a queue for this workgroup number	ULONG	
Party2WGAnswerTime	Timestamp as to when an agent or extension answered the call, or made a connection to the switch to pick-up a call	ULONG	
Party2WGEndServiceTime	Timestamp as to when a call has been disconnected from an incoming or outgoing trunk.	ULONG	

Party2WGWaitDuration	Duration (in seconds) of a call in the queuing state	ULONG	
Party2WGHandleDuration	Duration (in seconds) of the time a call has been connected to an agent	ULONG	
Party2Tenant	Extension's tenant name	UCHAR (31)	
Party2Reserve3	Reserved	UBYTE	
Party2Reserve4	Reserved	UBYTE	

Note: Timestamps are offsets, in seconds, from June 1970. The reference clock is the AltiServ system for both CDR and AltiGen-provided client applications such as Center 4.0 and AltiView 4.0.

Start Time	AltiWare system time when answer supervision has been given to an incoming trunk from the C.O., or in the case of outbound calls, when an outgoing trunk has been seized. See other notes in body of this document.	ULONG	Timestamp
End Time (of call; start time of wrap up)	TimeStamp when either the trunk is disconnected or extension is hung-up, whichever is earlier, or when an agent has a wrap-up setting, it is the starting time of wrap-up state for an incoming call.	ULONG	When the incoming or outgoing trunk has been freed, i.e. set to idle state.
WG Wrap Up Time	TimeStamp when an agent extension within a workgroup goes out of wrap up state	ULONG	See WG Wrap-Up Duration for explanation. This is the timestamp for CDR release after wrap-up.
VM Start Time	TimeStamp indicating when a caller enters the AltiMail voicemail system.	ULONG	
Attendant Duration	Duration (in seconds) of a call is connected to auto attendant. This value an accumulated value if the call entered AutoAttendant multiple times during the course of the call.	ULONG	
WG Wrap Up Duration	Duration (in seconds) of wrap-up phase of the last workgroup agent to handle the call	ULONG	<p>Wrap-up duration is the time an agent handles administrative tasks after talking to a caller.</p> <p>The CDR for the call is temporary held in AltiWare memory until the agent signals that they are done with wrap-up activities. This signal is accomplished through AltiGen's Center 4.0 client application used by the agent. A timeout release method is also available in AltiWare. In either event, when the wrap-up complete event is received, additional application information can be attached to the CDR record and then the record is written to the CDR database. See User-Defined data below.</p>

V Msg Duration	Duration (in seconds) of the message left by the caller. This shows how long voice messaging contributed to call length and trunk billing.	ULONG	
Call Duration	Duration (in seconds) of the total call from StartTime to EndTime	ULONG	
Exit State	Under what condition was the call terminated. Callers can decide to abandon a call at any time, and using exit state codes, many types of reports can be created to measure when they abandon, such as from AutoAttendant, from a ring-no-answer phone (agent or otherwise), from waiting in a queue, or just before voicemail recording.	ULONG	1 -- All 2 -- Auto Attn 4 -- RNA 8 -- WG Queue 16 -- VM No Rec.) 32 -- VM Record 64 -- Connect 128 -- Logon 256 -- Logoff 512 -- All Trunks Busy 1024 -- No Session 2048 -- Other
URL	URL when 'call' is initiated by a web user clicking the make-call button	UCHAR (129)	Please see AltWeb User Guide
User Data	Data input provided by the caller in response to an auto-attendant prompt, or data supplied by an agent desktop application over AltLink Plus.	UCHAR (129)	Agent data &var1=value1&var2=value2...(not comma delimited) See Glossary for details

5.1 Configuration Areas affecting CDR information

- Routing and Route Name - How calls are routed in outcall routing will naturally be reflected in the CDR record. The Route names configured in AltAdmin will appear in the route table name area of the records.
- Multi-Tenant naming - Each extension table entry in AltAdmin has a field to identify the extension owner. If a name is placed in this field, then this will be the name used in the CDR record to represent the tenant or department associated with the particular extension.
- Wrap-up - Setting the wrap-up time or supporting AltX ActiveX controls can affect the level of CDR information. For example, using ActiveX for AltLinkPlus, a client application can place wrap-up data into the "User Defined" data field of the CDR record. This is useful if you want to correlate business information with call handling information: revenue achieved verses talktime by agent. A system integrator is required to use AltGen's AltX ActiveX control.
- Ring No Answer configurations and VM -- Agents are supposed to sign-on to workgroups and answer calls. On occasion, an agent or extension may be signed-on but mistakenly walked away from their desk. Under these conditions, AltAdmin allows the administrator to define what AltServ should do if it encounters a Ring No Answer condition on a phone. For example, it can send the caller to voice mail or to another agent or back to queue or to auto attendant. How this configuration is set-up will determine the types of CDR records that will be recorded for this condition. Since ALTIWARE tracks all incoming calls from a trunk to an extension, this also applies to calls routed to regular extensions, not just workgroups.
- Sign-on and Sign-off -- Note that the CDR records database also supports a special record type. This record type is to record when agents sign-on and when they sign-off from a workgroup. There will only be information of when the action has taken place and which agent signed on and off. Therefore, a reporting program should always check to see if the record it is using or examining is for sign- on/off or for tracking the nature of a call. An agent logon/logoff record should have agent's extension number and Pad information in party 1.

5.2 Example Call Sequences and their effect on CDR records.

One objective within of the CDR record is to track the talk time of agents and individuals for incoming and outgoing calls. For incoming calls, this is expressed in the CDR data schema as Party1 and Party2. The concept is to track a given call across multiple extension transfers. For inbound and outbound calls, the guiding principle is that Party1 contains the initial contacting individual: for outbound calls it is the person making the initial call; for inbound calls, it is the first extension speaking with the caller, agent or regular extension. Party 2, if filled in with data, is for calls transferred to another agent or extension.

Many, many call sequences are possible. Here are some examples for inbound calls to a call center:

1. Incoming Call → Auto Attendant → Agent (Party1, WG A) → Transfer → Agent (Party2, WG B).
2. Incoming call → Auto Attendant → Agent (Party1, WG A) → Transfer → Agent (Party2, **WG A**).
3. Incoming call → Auto Attendant → Agent (Party1, WG A) → Park. **Party2 (agent or extension)** picks up parked call.
4. Incoming call → Auto Attendant → Agent (Party1, WG A) → Transfer → **Extension (Party2)**.
 - CDR Record Result => First Agent is in party 1 , Second Agent/Ext is in Party2.
5. In Call → Auto Attend → (Party1, WG A) → Transfer → Agent (Party2, WG B) → Transfer → Agent (Party3, WG C).
 - Party 1 is Party 1 data: Party2 contains Party3 time data . Party 2 time is lost, but can be Recovered by subtracting Party1+Party2 from total call duration – AutoAttendant duration. This same principal applies for even further call transfers, such that all intervening time between the Party 1 and Party2 is found aggregated and calculated in the same way.
6. In Call → Auto Attend A → Agent (Party1, WG A) → **Ring No Answer** → **Auto Attend B**.
 - Party 1 is ring no answer time, auto-attendant duration is A +B. Exit State=2.
7. Incoming call → Auto Attendant → Agent (Party1, WG A) → Ring No Answer → **VoiceM Record**.
 - Party1 should show duration but no talk time; No Party 2. VM shows duration.
8. Incoming call → AutoAttendant → Agent (Party1, WG A) → RNA → **Voice Message (no rec)**
 - Same as above. Exit Code is VMNoRec.
9. Incoming call → Auto Attendant → Agent (Party1, WGA) → **Park** → **VM message with recording**.
 - Party1 shows talk time. VM shows duration.
10. Incoming call → Auto Attendant → Agent (Party1, WGA) → **Transfer** → **Operator**.
 - Party1 is in Party1, Operator's extension number is in Party2.
11. Incoming call → Auto Attendant → **Extension (Party1)** → **Transfer** → **Extension (Party2)**.
 - Party1 is in Party1 data; Party2 in Party2 data; WG numbers are empty.

5.3 Reporting Fields Glossary

CDR Timestamps and Dates

The CDR data schema is provided with basic definitions. As with past OE releases, the StartTime, EndTime, and other timestamps in the OE 4.0 CDR database are in seconds and are offset numbers from a standard industry reference point of January 1, 1970 UTC. A reporting tool must compute the actual date and time for use in reports. When writing a program from C, the standard function call would be to: ctime (&time) where &time points to the UTC value (for example, 768027063). The call returns the Unix time and date (Wed May 04 04:51:03 1994).

Start time

- Start time can vary depending on the use and configuration of AltiWare for CO trunks.
- Start time will be a few seconds (2 typical) after incoming trunk seizure if the incoming trunk type is a tie trunk or an analog or T1 C.O. trunk not supporting Caller ID or ANI signaling.
- Start time will be a seven (7secs) or more if the incoming analog or T1 trunk supports callerID/ANI since the Central Office (C.O.) first sends these digits between the first and second ring cycles before the target device is to be connected. This is good, since carrier billing does not start until the target device answers.
- Start time for outgoing trunks is immediately when AltiWare attempts to seize an outgoing trunk; hence even for outgoing calls which hit an all trunks busy signal.

Terms used in the data schema and in reporting:

Account Code	A number entered by a caller to represent how the call should be tracked or billed
Agent	A service representative at a company who consistently handles customer inquiries of all types.
Agents Signed On	The number of agents, signed on to the phone system to be agents, using their phone or Center 4.0 to sign-on.
All Trunks Busy	An All-Trunk-Busy record should have dialing extension in party 1, dialing number in <i>Trunk Remote Number</i> . If call is made by out call routing, out call route and overflow routes should be set. All trunks busy means that there were no free outgoing trunks available for a given route.
Analog	Telephone lines going to the central office (trunks) and/or telephone lines going to the phone systems desktop phonesets using standard analog communication; voltage variations represent voice signals.
ANI	Automatic Number Identification : the phone number of the person or site making a phone call to the system. ANI is provided on T1/PRI circuits only, and represents the billing number of the caller, not necessarily the phone number; for example, ANI for people calling from a company.
ASA	Average Speed of Answer: the amount of time, on average, that a company wishes to answer incoming calls; also, the actual average amount of time it takes before a caller is answered by an agent.
Auto Attendant Duration	Auto Attendant Duration is the amount of time a caller is listening and responding to call processing steps in the phone system auto attendant process.
Average Call Duration	Average Call Duration is average the amount of time a calls are taking from phone system answer to phone system disconnect.
CallerID	The phone number of the calling party. CallerID differs from ANI in that CallerID is the phone number of the phone from which the caller is calling as opposed to the billing number for the phone. If a caller is calling from a business, the CallerID will be different from the ANI number in most cases.

Calls in Queue	The number of calls waiting in a queue for an agent or answering device.
Carrier	The voice telephone network provider such as AT&T, MCI and Sprint.
Carrier #	The 10XXX dialed number which is used by a caller or the system to inform the local switching system which Carrier has been selected to handle the phone call: for example, AT&T is 10288.
CLID	The Caller Line Identification is the european term for CallerID.
Disconnect	When a call disconnects from the phone system; if an extension disconnects first, then; if a incoming caller disconnects first, then
DNIS	Direct Number Inward Service is the phone number dialed by the caller. Usually companies purchase a block of DNIS numbers from the local central office so they may gives customers direct access to key employees. DNIS numbers can be 800 numbers which represent specific types of service offered to the public by a company. DNIS numbers, in call centers therefore, can conceptually be regarded as applications.
Call Duration (Duration)	Call Duration is average the amount of time a call takes from phone system answer to phone system disconnect.
Abandonment	Incoming calls whereby the call decides to disconnect before completing a call processing state in the phone system: listening and handling autoattendant, while waiting in queue, or while in voice mail. Also see short calls. Notice that this information is not at all the same as the Abandonment from Queue found in AltiGen's Center 4.0 real time screens. There the system is measuring calls leaving the queue only, but not necessarily abandoning the call from the system.
Exit State	The state of the call in the phone system when the caller decided to disconnect. The nominally correct exit state is when a caller disconnects during conversation with a person or after leaving a voice message. Exit state numbers help reporting tools describe and total calls which early abandon as well as normal calls.
ExitQ	When the call exited a workgroup queue.
ExitVM	When the call exited voicemail.
Extension	The phone number of a phone on the phone system. AltiWare has extension numbers representing phonesets (analog, IP), virtual extensions (logical locations), and workgroups (queues for agents).
Handled Calls	The number of calls actually processed successfully to a normal disconnect exit state: answered by a person, or the person completed a voice message or listening to a prompt.
Handled WG	The number of calls handled by a workgroup in the phone system.
In WG Average Duration	The amount of time, on average, calls spent waiting for a free agent while in a queue.
Inbound	Calls arriving into the phone system over trunks, either public or private tie trunk lines.
IP	Internet Protocol -- IP is used to represent the concept and practice of encapsulating of voice into data packets carried on data networks, both private and public, including the Internet.
IP Extension	An extension within the AltiServ phone system based on encapsulated voice connections (IP voice) as opposed to analog phonesets. AltiServ supports physical phonesets and software phones using the IP method of voice transmission.
IP Trunk	A digital connection to a LAN or Wide Area Network (WAN) that can handle IP encapsulated voice transmissions.
Line	A term for pairs of wires which carry voice over analog circuits to the central office -- ie, trunks. Sometimes used also as station lines (extensions) and trunk lines (trunks).

Log-off with reason code	An agent can log out of a workgroup because they have a lunch break, classes, and other reasons. You, the manager, establish the meaning of numeric codes, and AltiAdmin records them when used.
MaxWaitTime Minutes (outbound)	The maximum amount of time a call has waited in queue to be handled. While many fields may represent duration in minutes or seconds, the use of minutes here is in the billing sense; the number of billable minutes for phone calls. This is particularly of interest for outbound phone calls, and is useful for billing comparisons.
NodeID	The AltiServ system number (from 0 - 128) which was assigned to a given AltiServ system in AltiAdmin. The number is used to separate CDR records from different AltiServ systems when the records are collected jointly at one site using one database server for consolidated reporting.
Outbound	Calls placed by users of the phone system to the outside world over public or private trunk circuits within the AltiServ system including analog, digital, and IP types.
OutCall Routing	Calls dialed on the AltiServ phone system can be processed by the system using routing tables. The routing tables and their configuration options is referred generically as outcall routing. Outcall routing permits companies to restrict the types of outbound calls, change their dialing pattern, determine the type of trunk to be used, and determine the type of carrier to be used.
Overflow Calls	Calls which could not be handled by a primary service and must spill over to an alternative service. In the case of AltiServ/AltiWare, this applies to outgoing calls finding all trunks busy for a given route table. AltiServ/AltiWare currently does not support overflow queuing for inbound calls waiting for a free agent.
PAD	A Physical ADdress generalized to represent the physical slot on the processor chassis where an interface board is located, and the channel assigned on that interface board represent an extension or trunk port.
Party 1	Party1, found in the database schema, represents the first extension originating an outbound call or answering a incoming call from a trunk. In a call center, Party1 will typically be the first agent to answer the caller.
Party 2	Party2, found in the database schema, represents the second extension answering an incoming call as the result of receiving the call via a call transfer or call pick-up. In a call center, Party2 will typically be the second agent (often supervisor) who answered the call. What is important to understand is that Party2 accumulates the call handling time for any additional successive call transfers or call processing. Therefore, the times shown for Party2 can represent more than one additional extension to have handled an incoming call. The CDR field, MoreThan2WG will indicate if the Party2 field represents multiple extensions handling the call after the first Party1 agent.
PRI Queued Call	ISDN Primary trunks A call that has entered the queue as a result of not finding any free agents in a workgroup, or for an extension, and must now wait for an extension to come free. The queue duration associated with a queued call includes the ringing time of the target extension.
Rate Tables	AltiWare 4.0 does not have rate tables unlike past releases. Instead, the bundled reporting package, Call Analyst, uses AltiWare's CDR records and its own rate tables to produce reports which cost outbound calls according to user-defined rates: cost/minute.

Reason Code	This is a number, from 0-255 that was entered by a workgroup agent using the Center 4.0 client application to indicate the reason they made themselves unavailable to receive calls even though they may be scheduled for work. An arbitrary example would be code 20, representing "lunch break".
RNA	Ring No Answer (RNA) is the condition when a call reaches an extension and the called extension does not answer. This can be true for any type of call to any extension. However, within a call center, failure to reach an agent who's phone is in the "signed-on and idle" state, getting a RNA is a problem. Calls getting an RNA from an agent phone will be sent back to the queue (this is configurable) in most cases. The agent's phone will then be taken out of service.
Route Name	The name of a outbound (outcall) route table entry. This is useful to identify the type of routing treatment that was given to a call.
Route Table	A set of outbound call routing choices, provided by AltiWare within outcall routing, are defined within a route table. The route table identifies the trunks that should be used for calls assigned this route table. It also provides for how the dialed number should be modified, if at all, and whether the number needs to be preceded by a carrier code such as 10XXX.
Route Table Name	Same as route name. Route Table Name is the name assigned to the route, and Route Name is the name is the same name shown in reports under the title Route Name.
Routes	Route is the selected trunk to carry a phone call to the outside world. Route tables determine which routes should be used and how to use them. If one route is too busy (no trunks available), then the route table can be configured with an alternative choice. Ultimately, the call takes a single final route.
Score	This may or may not be found in the reports created within Call Analyst depending on applications created by the customer, not Call Analyst or AltiGen. Score is a number that represents how well a supervisor believes an agent has handled a particular call that the supervisor has silently monitored. Using the UserDefined fields provided in AltiWare's ActiveX AltiLink protocol, and in its CDR dataschema, a customer can associate a score with a call. This is a custom implementation.
Service Level%	Please see the dataschema descriptions as well. The service level percentage is the percentage of calls meeting the expectation for service set by the owner of the call center system. When reported in the Center 4.0 client screens, Service Level % is a real time snap shot of any given exact moment in the workgroup queue of calls meeting or exceeding performance. When reported in Call Analyst or via other custom reporting packages based on historical CDR data, the service level will represent the average over a given time interval defined by the program. Service level is the number of calls waiting less than a threshold time interval divided by the total number of calls in queue over the same interval. The threshold, which is the maximum amount of time the company would like a caller to have to wait for an agent, is configurable in AltiAdmin.
Session ID Number	A unique number, usually 9 digits or larger, assigned by AltiWare to a call. This number uniquely identifies a call. If an incoming call is transferred, by an agent to an outside trunk, then an additional new CDR record is created, however this additional record will retain the same sessionID. This permits reporting programs to combine together CDR records for the same call.

Short Calls	Short Calls, a statistic which only appears in Call Analyst reporting, provides the total number of outgoing calls which disconnected less than X seconds after actually getting answer supervision from the central office.
Short Duration	Like Short Calls, short duration is a proposed statistic for Call Analyst reporting, which provides the total number of incoming calls which lasted fewer than X secs after starting. The start of an incoming call is when an extension has rung and been answered, not when the trunk was seized.
SignOff	The timestamp when a workgroup agent signed off from the workgroup.
SignOn	The timestamp when a workgroup agent signed on to the workgroup.
SignOn Duration	The difference between Sign-on and Sign-off pairs: times in closest proximity. An agent can sign-on and off more than once each day, so there may be multiple such pairings in the CDR database.
Spillover	Spillover is the overflow from one route table to the next.
T1	T1 is a digital facility from the phone system (customer premise) to the central office, or from one CPE site to another between Altiserv systems (T1 tie trunks). Voice is encoded as zeros and ones on a channel (i.e. conceptual trunk) using industry standard encoding.
Talk Duration	The amount of time, totaled or averaged, that an extension services an incoming or outgoing call. Average talk durations are useful in call centers to measure how well an agent can handle callers.
Tenant OutCalls	Altigen's AltWare system can provide some, not all, of the features businesses find useful in shared tenant environments. One supported area is tracking who placed an outbound call by business name or dialing plan. This name is called the tenant name, and is configured in AltWare under each extension, and is placed in the CDR record each time that particular extension places an outbound call. The field is multi-purpose, so it can also be used by businesses wanting to track calls by department for bill-back purposes. Mixed use is not supported: tenant and department for example.
Threshold	The maximum amount of time a company wants an incoming caller to wait before they are serviced by an extension (i.e., an agent). This is related to service level, and is expressed as: "we want calls be serviced 90% of the time (service level) in less than 20 seconds (threshold)."
Transferred Calls	Calls transferred to an extension, another workgroup, AutoAttendant, voice messaging, or an outgoing trunk.
Trunk	The conceptual term for a voice connection to the outside world, such as the central office or another site. When analog circuits are involved, the physical wire pair is called a trunk. When digital circuits are involved, the trunk is a logical, dedicated channel on the digital connection. When IP trunks are mentioned, it means a data packet with a specific destination IP address, being sent out on a LAN or WAN network.
Trunk PAD Number	The board and channel numbers respectively: "0102".
Trunk Remote Number	1. The target phone number of an outgoing call. OR 2. The CALLID/ANI for an incoming call. OR 4. The IP address of the target far-end system for either incoming or outgoing IP calls.
Transfer-Trunk Number	The use of 'trunk' is a misnomer. If a call is <u>transferred</u> by an extension to a phone number outside the phone system, then the target phone number is placed in this field.

URL	If a caller enters Altiserv via the Internet using Altigen's Altiserv software (Web Button) then this field will contain the URL address for the caller accessing the system.
User Data	<ol style="list-style-type: none"> 1) If a call comes in from the Web via Altiserv, then this field MAY contain form data from the web page if you designed your web page to do so. 2) If a call is processed via auto-attendant, and information is collected and offered to an external application using the DDR function in auto-attendant, then the external application can populate this field with information about the call, collected or otherwise. 3) The structure of user data is an array or buffer of name-value pairs. You can have as many pairs as you wish but the total buffer is only 128 bytes long. A name-value pair is the your own field name followed by the field value. Each name-value pair is separated from others by an @ character. 4) User Data can be loaded into messages sent to Altiserv via Altigen's ActiveX control, Altiserv. 5) User Data can be received within messages sent by Altiserv to an external application via the auto-attendant DDR step and received by an application using Altigen's ActiveX control, Altiserv. 6) User data is preserved when calls are transferred between extensions and between extensions across multiple Altiserv systems. 7) User data is useful for screen pops and automated processing application. 8) Customers (you) need to employ a system integrator in order to implement the use of User Data.
VM Box Extension	The voice message mailbox is an extension number where calls are sent to leave messages. VM box extensions are used for workgroups in call centers as well as the standard uses for individuals.
VM Start Time	The time a call enters the voice mail system to potentially record a message.
WorkGroup	The workgroup is an extension representing a collection of individual extensions, such that each of these individual extensions can service a call arriving at the workgroup extension number. If none of these extensions is available at the time a call arrives, then the call is queued for this particular workgroup -- a workgroup queue. In the call center sense, the workgroup is can be configured for longest available agent queuing.
WorkGroup Number	The extension number for a workgroup.
Wrap-up Duration	The amount of time an agent takes to handle transaction information on another system or on paper after handling a caller. Once the caller disconnects, the agent's phone can be configured to be "unavailable" to the workgroup queue for a fixed or variable period of time even though the agent's extension is still signed onto the queue. This allows the agent time to wrap things up. The wrap-up time can be a fixed number of minutes after which the agent is forced back into taking calls, or it can be variable, controlled by the agent through Center 4.0 clients, where the agent 'releases' his phone for the next call. The settings can be designed to allow agents to control the wrap-up time until a limit occurs (the fixed time).

Appendix A: Summary of Report Fields – Example Methods of Calculation

The following reporting fields are suggested examples of information that is useful to a variety of different end-user communities, but by no means are required or exhaustive of what one can do with AltWare CDR. It is meant to show you how statistics can be derived from summing or averaging CDR record data.

Report Fields	CDR Record Sorts with CDR Field Names and Conditions	Comments
Inbound Trunk View		
<i>Total number of incoming calls by trunk type</i>	<i>StartTime</i> <i>TrunkDirection =2</i> Organized by <i>TrunkType</i> and Interval	
<i>Average Duration of incoming calls by trunk type</i>	<i>StartTime</i> <i>Trunk Direction =2</i> <i>CallDuration</i> Organized by <i>TrunkType</i> and Interval	Special processing to get average across all matching records using <i>CallDuration</i> for duration of single call
<i>Total number of incoming calls by trunk number</i>	<i>StartTime</i> <i>TrunkDirection =2</i> Organized by <i>TrunkPAD</i> and Interval	
<i>Total number of early abandoned calls by trunk number</i>	<i>StartTime</i> <i>TrunkDirection =2</i> <i>CallDuration < 2 secs</i> Organized by <i>TrunkPAD</i> and Interval	
Inbound Call View		
<i>Total number of incoming calls</i>	<i>StartTime</i> <i>TrunkDirection = 2</i>	
<i>Total number of incoming calls by DNIS number</i>	<i>Start Time</i> <i>Trunk Direction =2</i> Organized <i>TrunkDNIS</i> and Interval	
<i>Average Duration of incoming calls by DNIS number</i>	<i>StartTime</i> <i>TrunkDirection =2</i> <i>CallDuration</i> Organized by <i>TrunkType</i> and Interval	Special processing to get average across all matching records using <i>CallDuration</i> for duration of single call
<i>Total Number of queued calls and their average queue duration by DNIS Number</i>	<i>StartTime</i> <i>TrunkDirection =2</i> <i>PartyIWGQueuing Time</i> (not blank) Average of <i>PartyIWGWaitDuration</i> Organized <i>TrunkDNIS</i> and Interval	
<i>Total number of calls going to AA, their average autoattendant duration, by autoattendant name</i>	<i>StartTime</i> <i>TrunkDirection =2</i> <i>Attendant Duration >0</i> Average of <i>Attendant Duration</i> By <i>AutoAtdnName</i>	Up to 255 AutoAttendant Names

<i>Total number of calls going to VM from AA by autoattendant name</i>	<i>StartTime TrunkDirection =2 Attendant Duration >0 Party1WGHandleDuration =0 ExitState=10 or 20 By AutoAtdnName</i>	
<i>Total number of calls terminating in AutoAttendant by autoattendant name</i>	<i>StartTime TrunkDirection =2 ExitState=2 By AutoAtdnName</i>	

Report Fields	CDR Fields	Comments
<i>WorkGroup View</i>		
<i>Total number of calls by workgroup number</i>	<i>StartTime TrunkDirection =2 Party1WGHandleDuration >0 and/or Party1WGWaitDuration >0 By Party1WGNumber</i>	
<i>Total number of calls queued in a workgroup, and their average queue duration by workgroup</i>	<i>StartTime TrunkDirection =2 Party1WGHandleDuration >0 Average of Party1WGWaitDuration By Party1WGNumber</i>	
<i>Total number of calls disconnecting while in queue and their average queue duration by workgroup</i>	<i>StartTime TrunkDirection =2 Party1WGWaitDuration >0 Party1WGHandleDuration=0 ExitState=8 Average of Party1WGWaitDuration By Party1WGNumber</i>	
<i>Total number of calls going to VM from queue, their average queue time, and average VM message duration by workgroup</i>	<i>StartTime TrunkDirection =2 Party1WGWaitDuration >0 Party1WGHandleDuration=0 ExitState=10 or 20 Average of Party1WGWaitDuration Average of VMMsgDuration By Party1WGNumber</i>	
<i>Total number of calls reaching the workgroup agents -- average queue time, average talk time, and average wrap-up time --- by workgroup</i>	<i>StartTime TrunkDirection =2 Party1WGHandleDuration>0 Average of Party1WGWaitDuration Average of Party1HandleDuration Average of WGWrapUpDuration By Party1WGNumber</i>	Talk time is the length of time an agent actually talks to a customer. Wrap-up time is the time it takes an agent to complete/ close up a transaction: begins when the agent hangs up with the caller, to the time when an agent is ready to take the next call in queue.

<p><i>Number of calls transferred by agents to another location (outside, inside) by workgroup</i></p>	<p><i>StartTime</i> <i>TrunkDirection =2</i> <i>Party1WGHandleDuration>0</i> <i>TrunkRoute=(not blank) and/or</i> <i>Party2Number=(not blank)</i> <i>By Party1WGNumber</i></p>	<p>TrunkRoute defined means incoming call went out a trunk to another location Party2Number defined (and TrunkRoute=blank) means incoming call was transferred to another local agent</p>
<p><i>Number of calls transferred by agents to voicemail by workgroup</i></p>	<p><i>StartTime</i> <i>TrunkDirection =2</i> <i>Party1WGHandleDuration >0</i> <i>TrunkRoute= (not blank) and/or</i> <i>Party2Number= (not blank)</i> <i>By Party1WGNumber</i></p>	
<p><i>Service level of a workgroup</i></p>	<p><i>StartTime</i> <i>TrunkDirection =2</i></p> <p><i>Sum of number of call records where (Party1WGWaitDuration<X)</i> <i>Divided by number of call records where Party1WGWaitDuration>0,</i> <i>over the same selected interval.</i></p> <p><i>By Party1WGNumber</i></p>	<p>Service level is a percentage: it is the number of queued calls having a queue duration time <X, divided by the total number of queued calls; over the same time interval.</p> <p>X is the desired maximum wait time for a caller to reach an agent Y% of the time. X is a threshold, assigned in AltWare by the customer. Therefore, this report must ask the user what the threshold is as a search criteria for this report type.</p>
<p><i>Maximum waiting time for a call by workgroup</i></p>	<p><i>StartTime</i> <i>TrunkDirection =2</i> <i>Maximum(Party1WGWaitDuration)</i> <i>By Party1WGNumber</i></p>	

Reporting fields	CDR Fields Used	Comments
Agent View		
<i>Number of agents signed on by workgroup</i>	StartTime Interval very important here Sum of number of call records where a. ExitState=Hex80 and StartTime is > Midnight and < (starttime+Interval) b. And, ExitState=Hex100 FOR THE SAME Party1Number does not occur before (starttime+interval) By Party1WGNumber	Basically : how many agents were logged on to the given workgroup for the entire interval
<i>Average TalkTime and Average wrap-up time by Agent in each workgroup signed in</i>	StartTime TrunkDirection =2 Party1WGHandleDuration>0 Average of Party1HandleDuration Average of WGWrapUpDuration By Party1WGNumber By Party1Number(agent number)	
<i>Total Sign-On Duration by Agent</i>	For all matching records where: TrunkDirection=0 And Party1Number is the same; StartTime[ExitState=Hex100] – StartTime[ExitState=Hex80] = Sign-on Duration By Party1Number	Show how long each agent has been signed on that day, irrespective of how many workgroups the agent is signed onto.

CALL VIEW		
<i>Number of calls received with an ANI number</i>		
<i>Number of calls received with a CallerID</i>		
<i>Average Speed of Answer</i>		Average speed of answer is the average time it takes for an arriving call to reach an agent. Since a call can first go through an AutoAttendant before reaching an agent, and or in addition be queued, the average speed of answer covers both call duration <u>before and throughout the queue</u> until an agent answers.
<i>Number of calls received via the web</i>		Altigen can receive and accept IP calls from web page

Reporting fields	CDR Fields Used	Description
APPLICATION VIEW		
<i>Number of incoming calls routed by specific AutoAttendantName</i>	Count all call records where: StartTime TrunkDirection=2 AutoAtdnName = X Where X is a name entered by user for search.	Data directed routing (DDR) is an option in an autoattendant menu. The fact that a call would be routed by DDR would be contained in the User-Defined Data in the CDR record.
<i>Average Talk-Time and Average of a User-Defined Data item by Agent</i>	StartTime TrunkDirection=2 Party1WGHandleDuration UserData (parsed field=x) By Party1Number where: <i>X is the field position provided by the report user for fields within UserData(a comma delimited string) and where the field must be numeric.</i>	<ol style="list-style-type: none"> Suppose the customer tracks revenue per call. Altigen allows the customer to place how much revenue was generated by a call into the CDR record before it is written to the database. This wrapup information is placed in the customer defined area called the User defined Data field of CDR. Suppose I wanted to show the average talk time of Mary and John verses the average revenue they collected over all calls that day. This would be the average talk-time by revenue (a User-defined data item).
<i>Number of VM messages left as a result of queuing or AA</i>		Voice mail (VM)
<i>Average Duration of VM messages</i>		

Reporting Fields		
OUTBOUND TRUNK GROUP VIEW		
<i>Total Number of outbound calls</i>	StartTime TrunkDirection=4	
<i>Number of outbound calls by routelist number</i>	StartTime TrunkDirection=4 By route # Where route # can be one of : TrunkRoute TrunkOverflow Route1 TrunkOverflow Route2 Using the last number found in this list, top to bottom search.	

<i>Number of short duration outbound calls by trunk number</i>		Outbound calls with durations less than X secs for each trunk number
<i>Number of all-trunks-busy conditions by routelist name</i>		A field in User-Defined data can be set if all trunks are busy for a specific route group.
OUTBOUND CALL VIEW		
<i>Total Minutes by AreaCode</i>	Call Duration	
<i>Total number of calls by Area Code</i>		
<i>Total duration of calls by Area Code</i>	Call Duration	
<i>Average duration of calls by Area Code</i>		
<i>Total Number of outbound calls by account number or tenant name</i>		Very valuable for residential, multitenant, and departmental billing applications
<i>Total duration of calls by tenant name and routelist</i>	Call Duration	
OUTBOUND CARRIER VIEW		
<i>Minutes by 10XXX by hour</i>		
Minutes by trunk route number		

Appendix B - Example Reports

1. Inbound Trunk Type View

Date: 07/17/2000 - 24 Hour Period

	Analog	T1	PRI	IP	Total
<u>Number of Calls by Qtr Hr.</u>					
00:00 – 00:15	XXXX	XXXX	XXXX	XXXX	XXXXX
00:15 – 00:30	XXXX	XXXX	XXXX	XXXX	XXXXX
00:30 – 00:45	XXXX	XXXX	XXXX	XXXX	XXXXX
00:45 – 01:00 am	XXXX	XXXX	XXXX	XXXX	XXXXX
01:00 – 01:15					
etc...	XXXX	XXXX	XXXX	XXXX	XXXX
*					
*					
*					
23:34 – 00:00 pm	XXXX	XXXX	XXXX	XXXX	XXXX
Total Calls	100	1000	1874	550	3524

Graphic: Total all trunks by Qtr Hour

2. Outbound Trunk Type View

Date: 07/17/2000 - 24 Hour Period

	Analog	T1	PRI	IP	Total
<u>Number of Calls by Qtr Hr.</u>					
00:00 – 00:15	XXXX	XXXX	XXXX	XXXX	XXXXX
00:15 – 00:30	XXXX	XXXX	XXXX	XXXX	XXXXX
00:30 – 00:45	XXXX	XXXX	XXXX	XXXX	XXXXX
00:45 – 01:00 am	XXXX	XXXX	XXXX	XXXX	XXXXX
01:00 – 01:15					
etc...	XXXX	XXXX	XXXX	XXXX	XXXXX
*					
*					
*					
23:34 – 00:00 pm	XXXX	XXXX	XXXX	XXXX	XXXXX
Total Calls	100	1000	1874	550	3418

Graphic: Total All Trunks by Qtr Hour

3. ShortCall View

Date: 07/17/2000 - 24 Hour Period

<u>Trunk Number (PAD)</u>	<u>Incoming</u>	<u>Early Abandon</u>	<u>Outgoing</u>	<u>Short Duration</u>
"0102"	235	5	104	3
"0103"	106	7	98	1
*				
*				
*				
0204	0	0	38	5
0403	23	0	0	0
" 0000"				

Issues: "0000" trunk pad is a problem for some reporting software --

Incoming calls can be declared early abandoned calls if the call duration is <2 secs.

Outgoing calls can be declared "early abandoned or short-duration" calls for the same duration.

Short calls can represent caller indecision or bad trunk ports (PBX or Central Office).

4. Out Call Route View

Date: 07/17/2000 - 24 Hour Period

<i>Route Table Name</i>	<i>Number Calls</i>	<i>Ave. Call Duration</i>	<i>Number Overflowed</i>
Sprint 1	235	5	104
MCI	106	7	98
*			
*			
*			
North Campus	5	0	0
South Campus	23	0	4

5.0 Outbound Route View

Date: 07/17/2000 - 24 Hour Period

Route Name	Sprint1	MCI	North Campus	South Campus>
Number of Calls by Qtr Hr.					
00:00 – 00:15	XXXX	XXXX	XXXX	XXXX	
00:15 – 00:30	XXXX	XXXX	XXXX	XXXX	
00:30 – 00:45	XXXX	XXXX	XXXX	XXXX	
00:45 – 01:00 am	XXXX	XXXX	XXXX	XXXX	
01:00 – 01:15					
etc...	XXXX	XXXX	XXXX	XXXX	
*					
*					
*					
23:34 – 00:00 pm	XXXX	XXXX	XXXX	XXXX	
Total Calls	100	1000	1874	550	

5.0 Outbound Route View

Date: 07/17/2000 - 24 Hour Period

Route Name	Total Calls	Average Call Durations
MCI	XXXX	3.45
SPRINT	XXXX	2.56
North Campus	XXXX	4.79

6.0 Area Code View - Inbound

Date: 07/17/2000 - 24 Hour Period

INBOUND			
Area Code	Number	Minutes	Average
408	14		
414			
510			
550			
*			
*			
702			

7.0 Area Code View - Outbound

Date: 07/17/2000 - 24 Hour Period

OUTBOUND			
<i>Area Code</i>	<i>Number</i>	<i>Minutes</i>	<i>Ave. Duration</i>
408	14		
414			
510			
550			
*			
*			
*			
702			

Graphic: Geographic Grouping of Area Codes with Number of Calls on Map Background

8.0 Tenant OutCall View

Date: 07/17/2000 - 24 Hour Period

OUTBOUND			
<i>Tenant-Name</i>	<i>Number</i>	<i>Minutes</i>	<i>Ave. Duration</i>
Carl Johnson	14		
Martha Smith			
Alan Green			

Note: That Tenant Name is that of Party1 Tenant Name in the CDR record, not the Trunk Tenant Name.

9.0 Account Code OutCall View

Date: 07/17/2000 - 24 Hour Period

OUTBOUND			
<u>Account Code</u>	<u>Number</u>	<u>Minutes</u>	<u>Ave. Duration</u>
701678	14		
701772			
801919			

10.0 Inbound Call View - Time

Date: 07/17/2000 - 24 Hour Period

WG Number: _____ user entered ('All' an option)

	<u>Number</u>					<u>Average Duration</u>			
	<u>Total</u>	<u>Queued</u>	<u>ExitQ</u>	<u>Handled</u>	<u>Transfer</u>	<u>Total</u>	<u>Queue</u>	<u>Talk</u>	<u>Wrap-Up</u>
00:00 – 00:15	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00
00:15 – 00:30	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00
00:30 – 00:45									
00:45 – 01:00 am									
01:00 – 01:15									
etc...									
	*								
	*								
	*								
23:34 – 00:00 pm	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00

Graphic: (1) Number Queued by Qtr Hour , (2) Queue Ave Dur by Qtr Hour

11.0 Inbound Call View – DNIS

Date: 07/17/2000 - 24 Hour Period

WG Number: _____ user entered ('All' an option)

	<u>Number</u>					<u>Average Duration</u>			
	<u>Total</u>	<u>Queued</u>	<u>ExitQ</u>	<u>Handled</u>	<u>Transfer</u>	<u>Total</u>	<u>Queue</u>	<u>Talk</u>	<u>Wrap-Up</u>
(408) 456-4567	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00
(408) 456-4568	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00
(408) 456-4569									
	*								
	*								
	*								
(800) 568-2200	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00

Notes:

WorkGroup X should reflect both records of Party1 and Party2.

ExitQ is records where WaitDuration >0, AND ExitState is = 4 OR 8 OR 16 OR 32 .

Transfer events are counted when records have a defined Party2 PAD entry.

12.0 Inbound Call View – WorkGroup

Date: 07/17/2000 - 24 Hour Period

WG Number: _____ user entered ('All' an option)

	<u>Number</u>					<u>Average Duration</u>			
	<u>Total</u>	<u>Queued</u>	<u>ExitQ</u>	<u>Handled</u>	<u>Transfer</u>	<u>Total</u>	<u>Queue</u>	<u>Talk</u>	<u>Wrap-Up</u>
WG Number 1	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00
WG Number 2	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00
WG Number 3									
*									
*									
*									
WG Number N	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00

13.0 AutoAttendant View

Date: 07/17/2000 - 24 Hour Period

<u>AA Table Name</u>	<u># Calls</u>	<u>Ave AA Duration</u>	<u>#Exit VM</u>	<u>#Disconnect</u>	<u>#WG</u>	<u>#EXT</u>
AA Name1	xxxx	00:00	xxxx	xxxx	xxxx	xxxx
AA Name2						
AA Name3						
*						
*						
*						
AA NameN						

14.0 Agent View Within Work Group

Date: 07/17/2000 - 24 Hour Period

For WorkGroup XX: User entered

<u>Agent</u>	<u>Number of Calls</u>					<u>Average Duration</u>				<u>Score</u>
	<u>Total</u>	<u>HandledWG</u>	<u>Transfer'd</u>	<u>RNA</u>	<u>Outbound</u>	<u>InWG</u>	<u>Talk</u>	<u>WrapUp</u>	<u>Outb</u>	
Ext	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00	xxxx
Ext	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00	xxxx
Ext										
*										
*										
Ext	xxxx	xxxx	xxxx	xxxx	xxxx	00:00	00:00	00:00	00:00	xxxx

Graphic: Scores by Extension : Bar Graph, Horizontal, Descending Order of Score value

14.0 Agent View

Date: 07/17/2000 - 24 Hour Period

For Agent Extension XX: User entered

Agent	Number of Calls			Average Duration		Signed On Duration
	.WG Handled	Tf'd	RNA	Talk	WrapUp	
WG#	xxxx	xxxx	xxxx	00:00	00:00	00:00
WG#	xxxx	xxxx	xxxx	00:00	00:00	00:00
*						
*						
*						
WG#	xxxx	xxxx	xxxx	00:00	00:00	00:00

Note: "InWG" is the Log-on Duration for agents within the WG#.

Note: Score = Total UDF1 / (Total Talk + Total Wrapup Time + Total Outbound -Times)
 Where, UDF1 is the "Score" User Defined Field 1 with a numeric value that is:
 0<=X<Maximum score allowed.
 UDF1 is found in the user-defined field of the call record, as a name-value pair,
 Whose name in the name-value pairing, called score.

15.0 WorkGroup Service View

Date: 07/17/2000 - 24 Hour Period

For WorkGroup Number XX: entered by user

At Threshold: YY entered by user

Time Interval	Service Level%	Calls In Queue	Number Agents Signed On	ASA	MaxWaitTime
00:00 – 00:15	xx	xxxx	xxxx	xxx	xxxxxx
00:15 – 00:30	xx	xxxx	xxxx	xxx	xxxxxx
00:30 – 00:45					
00:45 – 01:00 am					
01:00 – 01:15					
*					
*					
23:34 – 00:00 pm	xx	xxxx	xxxx	xxx	xxxxxx

Graphic: (1) Service Level by Quarter Hour, (2) Agents Signed on by Qtr Hour
 ASA: Average Speed of Answer

Service Level % = For a given workgroup, select time interval, and chosen threshold (secs): ((count the number of calls exiting the workgroup queue [assigned to agent, disconnect, voicemail] that are less than the defined threshold Z) and divide this by (the count for the number of calls exiting the workgroup queue overall)) times 100.

Calls in Queue = For a given workgroup and selected time interval, count the number of records where Party1 WG wait duration >0 AND/OR Party2 WG wait duration >0 AND the Party1 or 2 exit queue timestamp is less than the top time and greater than the bottom time for the time interval.

Number of Agents Signed On = For a given workgroup and selected time interval, count the number of records where an agent (ie. Party1 with workgroup number) has signed on before the end time for the selected interval) and subtract from the latter (the number of records where an agent signed-off before the start time for the selected interval). [# signed-on before end interval time – signed-off before start interval time]

Maximum Wait Time = For a given workgroup and selected time interval, continuously bubble up the maximum wait time duration of all calls in or exiting the queue over the interval.

Average Speed of Answer = For a given workgroup and selected time interval, compute the average call duration for all calls from initial trunk answer to first contact with an agent. Use only Party1WGAnswerTime – Start Time to find the ASA for a given call.

16.0 Agent SignOn View

Date: 07/17/2000 - 24 Hour Period

For Agent Extension XX:

	<u>Sign On</u>	<u>SignOff</u>	<u>WG #</u>	<u>Reason Code</u>
00:00 – 00:15	x	x	xx	xxxx
00:15 – 00:30	x	x	xx	xxxx
00:30 – 00:45				
00:45 – 01:00 am				
01:00 – 01:15				
etc...				
*				
*				
*				
23:34 – 00:00 pm	x	x	xx	xxxx

Graphic: Number of Agent SignOffs for Each Reason Code

17.0 Web Calls

Date: 07/17/2000 - 24 Hour Period

	<u>Number</u>	<u>Duration</u>
00:00 – 00:15	xxxx	00:00
00:15 – 00:30		
00:30 – 00:45		
00:45 – 01:00 am		
01:00 – 01:15		
etc...		
*		
23:34 – 00:00 pm	xxxx	00:00

18.0 Carrier View

Date: 07/17/2000 - 24 Hour Period

<u>Carrier #</u>	<u>Minutes</u>
10xxx	00:00:00
10xxx	00:00:00
MCI	
SPRINT	

19.0 Route Table View

Date: 07/17/2000 - 24 Hour Period

Route Table Number: YY

	<u>Number</u>	<u>Duration</u>	<u>Cost?</u>
00:00 – 00:15	xxxx	00:00	
00:15 – 00:30			
00:30 – 00:45			
00:45 – 01:00 am			
01:00 – 01:15			
etc...			
*			
*			
*			
23:34 – 00:00 pm	xxxx	00:00	

Graphic: Number by Qtr Hour

20.0 Voice Mail Spillover for ACD Calls View

Date: 07/17/2000 - 24 Hour Period

Voice Mail Box Ext.	<u>Number of Calls</u>				Total Duration	Average Duration
	AA	Queue	Agent	Total		
Xxx1	xxxx	xxxx	xxxx	xxxx	00:00:00	00:00
xxx2	xxxx	xxxx	xxxx	xxxx	00:00:00	00:00
*						
*						
*						
xxx2	xxxx	xxxx	xxxx	xxxx	00:00:00	00:00

Graphic: Total by Voice Mail Box Extension

Number of Calls Received with ANI/CallerID Number

ANI Number: xxx xxxxxxxx

Number of Calls: yyy

Number of Calls Received For DNIS number

DNIS Number: xxx xxxxxxx

Number of Calls: yyy

Number of Calls received for Extension number

Extension number: xxxx

Number of Calls:: zzz