<u>**PROGRAMMING & CALCULATIONS FOR CDR REPORT WEB SITE**
for www.MBITServices.com.au</u>

<u>**DOCUMENT VERSION 1.0 FIRST DRAFT - 12 Dec 2012**</u>

<u>**DATABASES ON ELASTIX PBX SERVER (ip 10.10.20.5 / 255.255.255.0)**</u>

<u>**1. MySQL database**</u>

MySQL username: root
pwd: My5qL@cC3sS
databse name : **'asteriskcdrdb'**
contains the table: **'cdr'**

Each call record in 'cdr' table has the following fields:

calldate - date of call (0000-00-00 00:00:00) (YYYY-MM-DD HH:MM:SS)
clid - caller id
src - source number
dst - destination number
dcontext - context of call
channel - SIP channel of call source
dstchannel - SIP channel destination
lastapp - last application used
lastdata - last data command used
duration - time call process in the system
billsec - time from call being answered to hangup
disposition - state of call e.g. ANSWERED or NO ANSWER
amaflags -
accountcode - not currently used
uniqueid - unique id associated with call record
userfield - user assignable field

<u>**2. SQLite database found in /var/ww/db/acl.db on Elastix PBX**</u>

I am not familiar with SQLite, the folllowing information is a guide only.

sqlite3 /var/www/db/acl.db - this provided access to the database from the command line on the Elastix PBX without a need for password but logged in using root on an ssh session.

tables found in acl.db :

acl_group (shows group i.e. dept or team membership)
acl_user (shows ext association with)
acl_membership (connects a group to user with table numbers from each)

select * from sqlite_master;   this provided a list of tables

select * from acl_user; this provided a list of records stored in the table acl_user
in the form -

 id | name | description | md5 password | extension

e.g. - **3 | Mark | Mark's account | 0d107d09f5bbe40cade3de5c71e9e9b7 | 600**

select * from acl_group;   this provided the following:

description | id | name

e.g. **Sales team | 5 | Sales**

select * from acl_membership; this provided the following;

id | id_user | id_group

e.g. **3 | 3 | 5**

from the above example it shows Mark is on extension 600 and he is a member of the Sales team. This needs to be confirmed from the database tests.

FURTHER INFORMATION

- call records in asteriskcdrdb are produced per extension, each time a phone call is made by an extension when the call is hungup a record is written to the asteriskcdrdb database, even if the call failed, or went to voicemail or did not complete it is still written to the database.

- records to the /var/www/db/acl.db database are updated whenever a staff member updates the information for users and their team membership or extension number. This information can change from day to day and how it effects the totals displayed will have to be discussed as the design develops.

- Will need to create an additional field in the 'asteriskcdrdb' database 'cdr' table to act as a flag for each call record that is read, and set it to 1 when the call record has been read or 0 if it has not been read. (e.g. **import_cdr** = 1)

- will need to read call records as they come in, and store information in a seperate MySQL database on the web server. flagging the record after it is read so it will not be read again.

- Rows displayed on CALLS web pages should be arranged in order so that the Ext number that has the highest Total Calls (in minutes) is at the top row and the rest appear in descending order.

- Rows displayed on TEAMS web pages should be arranged in order so that the team with the highest Total Calls (in minutes) of all member extensions is at the top row and the rest appear in descending order.

- There are two kind of pages that need to be displayed (3 sets of each, see jpg's for examples of each)

1.1 - Calls / Today
1.2 - Calls / This week
1.3 - Calls / This month

2.1 - Teams / Today
2.2 - Teams / This week
2.3 - Teams / This month.

- information needs to refresh all the fields on average every 5-10 seconds (maybe configurable) and refresh the pages accordingly.

- pages will switch between 1.1 to 2.3 every 5 seconds (configurable between 1-5 settings up to 10 seconds, including a page pause feature.) More detail to be dealt with in web site

layout discussion.

PAGE TYPE - 'CALLS'

The same page template can be used for the following pages;

Page 1.1 - Calls / Today - example screen1.jpg
Page 1.2 - Calls / This Week - example screen2.jpg
Page 1.3 - Calls / This Month -example screen3.jpg

CALCULATIONS FOR COLUMNS TO BE DISPLAYED ON 'CALLS' PAGES

The below calculations are meant as a guide only, if there is a better way of working out this information and storing it, then please follow your knowledge on that, feel free to change any features. But please document it, and use sensible structure so I can get it developed later as required.

VARIABLES:

(you may change these variable names as required they are just a guide, but they must be understandable , documented , and easily read for later development)

$FIRSTEXT - First extension number in the system (e.g. 600 or 6000)
$LASTEXT - Last extension number in the system (e.g. 660 or 6060)
$THISEXT - Current extension number (e.g. 601 or 6001)

$CALL1MIN - Count of Calls less than 1 minute in length
$CALL5MIN - Count of Calls greater than 1 minute but less than 5 minutes
$CALLPLUS5 - Count of Calls greater than 5 minutes.
$CALLCOUNTX - Total Count of calls by extension number

$CALLSTODAY - Total in minutes of all calls by extension X for today (time: HH:MM:SS)
$CALLSTHISWK - Total in mins of all calls by extension X for this week (HH:MM:SS)
$CALLSTHISMTH - Total in mins of all calls by extension X for this month (HH:MM:SS)

$DIALEDNUM - Number dialed, an array used for storing and checking unique dialed numbers. (varchar(80))

$UNIQTODAY - Count of phone numbers not already seen in $DIALEDNUM today for each extension.
$UNIQWEEK - Count of phone numbers not already seen in $DIALEDNUM this week for each extension.
$UNIQMTH - count of phone numbers not already seen in $DIALEDNUM this month for each extension.

1. Calculation to find extension number in each call record (display in COLUMN 1 on CALL PAGES)

database: asteriskcdrdb
table: cdr

- Check 'src' field for extension number (numbers between $FIRSTEXT and $LASTEXT)
if not found in 'src' then check 'dst' field extension number.

(if found in 'src' then call was outbound from extension, if found in 'dst' then call was inbound to extension. if found in both 'src' & 'dst' then this was an internal call between extensions and should be ignored.)

- set $THISEXT to the current ext number for this call record.

- $THISEXT will be displayed in Column1 of all three CALL pages.

2. Calculation to find length of call (COLUMN 2, 3 & 4 on PAGES)

database: asteriskcdrdb
table: cdr

use 'billsec' field, this shows time in seconds from the moment call is answered until hangup. *(DO NOT USE 'duration' field as this starts from the moment call is in the system.)*

'billsec' is time in seconds, but is stored as an integer.

if billsec = 0 then call was not successful and record should be ignored.

If call is < 60 seconds then add 1 to $CALL1MIN for $THISEXT
If call is >59 & <300 then add 1 to $CALL5MIN for $THISEXT
If call is >259 then add 1 to $CALLPLUS5 for $THISEXT

For CALLS / TODAY page - column 2 should display the $CALL1MIN total,
column 3 should display the $CALL5MIN total,
and column 4 should display the $CALLPLUS5 total for each extension for the current 24 hour period from midnight to midnight.

For CALLS / THIS WEEK Page - column 2, 3 and 4 should show totals for the current week period - 00:01am Monday to 11:59 Sunday.

for 'CALLS / THIS MONTH' page - column 2, 3, and 4 should show totals from 00:01am on first day of current month to 11:59 on last day of current month

3. Calculation to find unique dialed numbers for each extension (COLUMN 5 on PAGES)

- Check 'src' field for extension number (numbers between $FIRSTEXT and $LASTEXT) if found then copy 'src' to $THISEXT.

- if extension number is found then check 'dst' field for the dialed number, and if it is NOT an extension number (number between $FIRSTEXT and $LASTEXT) , then....

 - copy 'dst' number to $DIALEDNUM for $THISEXT.

 -but If 'dst' is an extension number then ignore record, as this was an internal call.

- if 'dst' does not already exist in $DIALEDNUM then add 1 to the $UNIQTODAY counter to keep track of unique dialed numbers made by $THISEXT.

further calculations will be need for the following:

for CALLS / TODAY page, $UNIQTODAY in column 5 should show total count of unique dialed numbers for the current 24 hour period from midnight to midnight for each extension.

for CALLS / THIS WEEK page, $UNIQWEEK in column 5 should show total count of unique dialed numbers for the current week from 00:01am Monday to 11:59 Sunday for each extension.

for CALLS / THIS MONTH page, $UNIQMTH in column 5 should show total count of unique dialed numbers for the current month period - 00:01am on first day of current month to 11:59 on last day of current month for each extension.

4. Calculation to find total minutes of all calls made per extension (COLUMN 6)

- Check 'src' field for extension number (numbers between $FIRSTEXT and $LASTEXT)

- if extension number is found in 'src' then also check 'dst' field for 'ext' number'

- if number found in 'src' is NOT an extension number, then check 'dst' for extension number, and if found then use 'dst' for $THISEXT.

- if number found in 'src is an extension number and the number found in 'dst' is NOT an extension number then use 'src' for $THISEXT.

- If 'dst' is an extension number and 'src' is also an extension number then ignore time of call for this record as it was internal call.

- check 'billsec' field and add this (in seconds) to $CALLSTODAY for extension $THISEXT.

further calculations will be needed to create the following;

for 'CALLS / TODAY' page, column 6 should show $CALLSTODAY total in HH:MM:SS for the current 24 hour period from midnight to midnight.

for 'CALLS / THIS WEEK' page, column 6 should show $CALLSTHISWK total in HH:MM:SS for the current week period - 00:01am Monday to 11:59 Sunday

for 'CALLS / THIS MONTH' page, column 6 should show $CALLTHISMTH total in HH:MM:SS for the current month period - 00:01am on first day of current month to 11:59 on last day of current month.

PAGE TYPE - 'TEAMS'

The same page type can be used for the folllowing pages:

2.1 - Teams / Today - example screen4.jpg
2.2 - Teams / This week - example screen5.jpg
2.3 - Teams / This month. - example screen6.jpg

Information on team names (groups) and the extensions that are members of those teams is stored in a seperate SQLite database called - /var/www/db/acl.db
This information is updated by the user on the Elastix PBX server and may change at any time. This change needs to be taken into account in the way it may effect the call records being stored. TBD.

The extension number is the common key reference between MySQL database asteriskcdrdb and acl.db

CALCULATIONS FOR COLUMNS TO BE DISPLAYED ON TEAMS PAGES:

To get the Team name to be displayed in column 1.

The Team name can be found in the field called **'name'** from the table **'acl_group'** in '**acl.db'** database

To get all the extension numbers that are members of each Team

This needs to be confirmed, but I think the field **'id_user'** in the table **'acl_membership'** shows the id number for the extension that can be found in **'acl_user' table.**

and the field **'id_group'** that is in **'acl_membership'** table shows the id number of the team that can be found in **'acl_group'**

using this information we can work out the extensions in each team.

VARIABLES:

(you may change these variable names as required they are just a guide, but they must be understandable , documented , and easily read for later development)

$TEAMEXT - array of extension numbers that are members of a team
$TEAMCALLTOTALS - Will be accumulated from variables in CALLS PAGES calculations and calculated by adding all the $TEAMEXT call totals together for a team. This will then be displayed in HH:MM

$UNIQTODAYTEAM - Total count of unique calls made today by all extensions that are members of a team.
$UNIQWEEKTEAM - total count of unique calls made this week by all extensions that are members of a time
$UNIQMTHTEAM -- total count of unique calls made this month by all extensions that are members of a team.

$CALLSTODAYTEAM - Total calls in HH:MM for all extensions that are member of a team.
$CALLSWEEKTEAM - total calls in HH:MM for all extensions that are member of a team
$CALLSMTHTEAM - total calls in HH:MM for all extensions that are member of a team.

For pages TEAMS / Today (screen4.jpg)

The first column is 'Team'

this is taken directly from the acl.db fields to provide a team name and will be the same for all the TEAMS pages.

second column to display is 'Total (unique)'. This is total of unique dialed numbers per extension that is member of the team. This will be a total of the variable $UNIQTODAY found in the CALLS pages and the accumulated figure totalled in $UNIQTODAYTEAM for each extension that is a member of the Team.

$UNIQWEEKTEAM will keep the total for the TEAM / THIS WEEK page - screen5.jpg
$UNIQMTHTEAM will keep the total for the TEAM / THIS MONTH page - scrren6.jpg

third column is 'Total (Minutes)'. This is a HH:MM accumulated total of all the minutes in $CALLSTODAY found in the CALLS pages for each extension that is a member of the team.. This will be added together for all the extension in the team and stored in $CALLSTODAYTEAM.

$CALLSWEEKTEAM will keep the total for the TEAM / THIS WEEK page - scrren5.jpg
$CALLSMTHTEAM will keep the total for the TEAM / THIS MONTH page - screen6.jpg.

the fourth column is 'Top Callers'. This is a display of the top 3 extension numbers in the team, taken from the extensions with the highest total call time for the day that is found in comparing the variable $CALLSTODAY from the CALL Pages variable list for each extension in the team.

$CALLSTHISWK is the variable holding the information for the extensions to display in Top Callers for the TEAM / THIS WEEK page. The Top Callers column on this page should show the 3 extensions in the team with the highest $CALLSTHISWK

$CALLSTHISMTH is the variable holding the information for the extensions to display in the Top Callers column on the TEAM / THIS MONTH page. The top Callers column on this page should show the 3 extensions in the team with the highest $CALLSTHISMTH