

Introduction

This is a quick and informal discussion paper generated in response to some remarks in the gnuCash_user mailing list in relation to balances displayed by GnuCash in the accounts list..

Notes:

In the following text:-

- I attempt to define my terms as I go along. A new term will be shown in ***bold italic underline*** typeface.
- **transactions** are in all cases **posted** transactions

Balances

A ***balance*** can be (recursively) defined as, for any given account, the sum of an opening balance and a set of transactions with dates on or after the date of the opening balance.

Notes:

- Transactions dated earlier than the opening balance will, by definition, be included in the opening balance. For an Asset account, it is possible that an opening balance was entered at the time the account was created. For Income and Expenditure accounts, the balance is typically cleared at the start of the financial year (and transferred to an Equity account), and so the opening balance for such accounts may normally be considered to be zero by default.
- The opening balance on a given date **excludes** transactions for that date, and is therefore in fact the balance from the previous day. Thus an opening balance dated 1st July will in fact be the balance as calculated for 30th June.
- A transaction may be considered as dated according to either its posting date or its effective. In this document I am concerned only with the effective date. If there are multiple transactions for an account with the same effective date, then the balance for that day will be the balance including all of them. Of course, the balance as shown on an account register will be that calculated taking into account transactions up to and including the current line, and therefore in that context only the order in which transactions are sorted within date order is significant.

For any given individual account, there are a variety of basic balances, which differ according to the opening balance, end date and set of transactions considered. I would consider the following list to be significant:-

- 1) The ***Overall Balance*** of an account will be the sum of :-
 - its opening balance and
 - all posted transactions dated on or after the date of the opening balance, including those with future dates – ie, dated later than today!

In its basic form, the overall balance of an account ignores any sub-accounts. For balances considering also sub-accounts, see the “Total” variant below).

- 2) The ***Current Balance*** is similar to 1) above, but ignores transactions dated later than today.

Note that when considering the balance column in an account register, the balance is calculated transaction by transaction. For a register listed in date order, we may consider that, for each line, “today” is the moment in time represented by the current transaction, and thus encompasses that transaction and all those preceding, but not following, it.

It can be argued that any of the balances discussed in this paper might reasonably be calculated transaction by transaction, and displayed as a column in the account register, provided only that the register is listed in date order. (I would suggest that for a register sorted in anything other than date order there can be no meaningful content in any Balance column.) I would not wish to speculate on whether there might be any demand for such a facility!

- 3) The **Cleared Balance** is similar to 2) above, but ignores transactions not flagged as either “cleared” or “reconciled”. Note that as a future transaction cannot logically be cleared, the Cleared Balance need only be calculated on a Current basis – ie, not considering future transactions.
- 4) The **Reconciled Balance** is similar to 2) above, but ignores any transaction not flagged as “reconciled”. Note that as a future transaction cannot logically be reconciled, the Reconciled Balance need only be calculated on a Current basis.
- 5) The **Future Minimum Balance** is the minimum value selected from :-
 - The Current Balance (see above)
 - and
 - All future daily balances, calculated by applying all future transactions in date order, day by day, and inspecting the individual daily balances thus created.

(A daily balance for a given date is that calculated after applying all transactions dated up to and including that given date.)

One might consider the above to be the core, or basic, balances. In addition, Gnucash introduces several variations which might be applied individually or together to each of these basic balances.

The basic variations are:

- a) **<Currency>**. Unfortunately I run my installation in a single currency (GPB), so whilst I can guess the significance of this variation I would prefer not to speculate on it publicly I therefore leave this section for others to define!
- b) **Total**. The balances described above relate only to the opening balance and transactions relating to that specific account, and ignores any sub-accounts (and associate opening balances and transactions) that it may have. The **Total Balance** of an account will be the value calculated by recursively summing its own balance and the balances of its children
- c) **Nett Movement** or **NettMvmt**. Strictly speaking, this is not a balance at all, but instead represents a nett change to the balance over a period. It may be calculated either:-
 - By summing the relevant set of transactions dated between the start- and end-points of the relevant period
 - By deducting the opening balance as at the start date from the balance at the end-date.

Note that Gnucash implements a “Period Balance”, which is the Nett Movement between the start and end of the current financial period. This is a somewhat arbitrary, though not unreasonable choice (I think I would prefer that it used “Today” as the end point).

Provided one assumes a start date (the start of the current accounting period would be appropriate for almost any reasonable instance) the “Nett Movement” concept can in principle be applied as a variation to any other balance, and even to other variants of all those balances (see below). Even though the utility of some possible combinations is perhaps questionable.

One can logically apply from one to all of these variations to any of the core balances to produce a variant balance – and there may well be users who would wish to do so! By my (unreliable!) calculations, there are some 35 possible variant balances before one thinks of looking at arbitrarily dated balances! I would not expect GnuCash to keep these as “stock” balances, but if one specifies the contents of an accounts list column (or even of an account register column!) as

`<balance_type> [+<variation1> [+<variation2> [+<variation3>]]]`

and calculated the balance on that basis then it might even be manageable to generate any possible variant as required by the user. Moreover, it is at least possible that, considered and calculated in this structured way, calculation of balances could be coded more simply than for the current set of “off the shelf” balances (which I would guess are implemented as a discrete lump of code for each balance type supplied).

GnuCash Columns

Having established some concepts, we now come to a discussion of the columns available on the GnuCash Accounts tab.

The available balance-related column headings in GnuCash 2.4.2 are as listed below. Note that my “definitions” of balances above are based on what I believe to be the correct method of calculation, not necessarily on what GnuCash does. Similarly, my commentary below is based on my understanding of the intention of each column, but not an exhaustive proof that my understanding is correct. In any case of conflict between my commentary and what GnuCash actually does in real life, I would propose that I am correct (even if I might subsequently be prepared to be convinced otherwise!).

- **Present**
Corresponds to the Current Balance - 2) above. This column would perhaps be better renamed as “Current” or possibly “Today”.
- **Present <currency>**
Corresponds to the “<currency>” variant of the Current Balance - 2) above. This column would perhaps be better renamed as “Current (<currency>)”
- **Balance**
Corresponds to the overall Balance - 1) above. This column would perhaps be better renamed as “Overall”.
- **Balance (<currency>)**
Corresponds to the “<currency>” variant of the overall Balance - 1) above. This column would perhaps be better renamed as “Overall (<currency>)”.
- **Balance (period)**
Corresponds to the “Nett Movement” variant of the overall Balance - 1) above. This column would perhaps be better renamed as “Period Nett Movements”, possibly abbreviated to “PrdNetMvt”.
- **Cleared**
Corresponds to the Cleared Balance - 3) above
- **Cleared (<currency>)**
Corresponds to the “<currency>” variant of the Cleared Balance - 3) above

- **Reconciled**
Corresponds to the Reconciled Balance - 4) above
- **Reconciled (<currency>)**
Corresponds to the “<currency>” variant of the Reconciled Balance - 4) above
- **Last Reconcile Date**
Not a balance. Should represent the most recent date on which the account was reconciled with the statement. More pedantically, it should be the date of the most recent statement reconciled – but as the user is required to enter the date, it would be unwise to rely on the reconcile date and the statement date matching!
- **Future Minimum**
Corresponds to the Future Minimum Balance - 5) above
- **Future Minimum (<currency>)**
Corresponds to the “<currency>” variant of the Future Minimum Balance - 5) above
- **Total** Corresponds to the “total” variant of the overall Balance - 1) above
- **Total <currency>**
Corresponds to the “Total” and “<currency>” variant of the overall Balance - 1) above
- **Total (Period)**
Corresponds to the “Total” and “Nett Movements” variant of the overall Balance - 1) above, and would possibly be better renamed as “Total Period Nett Movements”, possibly abbreviated to “TotPrdNetMvmt”.

We can express the balances from this list in terms of the following grid:-

	Overall	Current	Cleared	Reconciled	Future Min
(vanilla)	Balance	Present	Cleared	Reconciled	Future Minimum
<Currency>	Balance<Currency>	Present<Currency>	Cleared <Currency>	Reconciled <Currency>	Future Minimum <Currency>
Total	Total	(1)	(4)	(5)	(6)
NettMvmt	Balance(Period)	(2)			
<Currency>+Total	Total Currency				
NettMvmt+Total	Total Period	(3)			

It seems to me that there are some important – some might say serious – omissions from this set. In particular, I would like to see

- “Total” (1), “NettMvmt” (2) and Total+NettMvmt (3) variants on the Current balance
- “Total” variant on Cleared (4) and Reconciled (5) and Future Minimum (6).

I would therefore like the grid to look like this: (balances that would be particularly important to me are shown underlined). Note My revised columnar headings!.

	Overall	Current	Cleared	Reconciled	Future Min
(vanilla)	<u>Overall</u>	<u>Current</u>	Cleared	Reconciled	<u>Future Min</u>
<Currency>	<currency> Overall	<Currency> Current	<currency> Cleared	<Currency> Reconciled	<Currency> Future Min
Total	<u>Total Overall</u>	<u>Total Current</u>	Total Cleared	Total Reconciled	<u>Total Future Min</u>
NettMvmt	<u>Overall NettMvmt</u>	<u>Current NettMvmt</u>			
<Currency>+Total	<Currency> Total Overall	<Currency> Total Current			
NettMvmt+Total	<u>Total Overall NettMvmt!</u>	<u>Total Current NettMvmt</u>			

Others for whom the Currency variants are important might wish to point to other omissions, which I will not attempt to second-guess.

Anyone using GnuCash to run their business may have good reason, at different times to see any of these balances, all of which have their own use in measuring current or future financial performance. It is unlikely that anyone would wish to see them all at the same time, but the ability to choose, say, any half dozen to show on the Accounts List page would probably be sufficient. Also, it can be argued that it could be helpful (assuming the user can find sufficient screen real-estate!) if it were possible to show multiple balance columns on an individual account register, with content selected from amongst the available “Current” variants. Failing that, the ability to replace the content of the current “Balance” column on the register with one of the other variants.

Colin Scott,
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