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# Liquidity Status calculations

## Background

Please refer to "CI HUB Product Guide, Version 1.3.5, 13 September 2021", section "4.4.2 Liquidity Update", to read about how the liquidity status changes between Amber, Green, etc. based on the liquidity changing.

The example scenarios given are examples of system behaviour documented in the CI Hub Product Guide, section "4.4.2. Liquidity update", items 12(a), and 12(d) respectively.

Consider a liquidity threshold configuration with:

'Threshold Level - Amber': 50,000

Clear Amber threshold percentage: 50%

With the 'Threshold Level - Amber' value of 50,000 and the 'Clear Amber threshold percentage' value at 50%, we can calculate the 'Clear Threshold Alert Level - Amber' using:

50,000 × ( 1 + ( 50 / 100 ) ) = **75,000**

'Clear Threshold Alert Level - Amber': 75,000

## Scenario 1 - Liquidity Reaching Amber status from Green status:

75,000 - (50,000 + [50% of 50,000])

= Clear Threshold Alert Level - Amber

50,000 - Threshold Level - Amber

= Clear Threshold Alert Level - Amber

25,000 (status = Amber)

= Clear Threshold Alert Level - Amber

- 35,000

= Clear Threshold Alert Level - Amber

- 35,000

= Clear Threshold Alert Level - Amber

95,000 (status = Green)

= Clear Threshold Alert Level - Amber

60,000 (status = Green)

= Clear Threshold Alert Level - Amber

1. Initial liquidity value is 95,000 which is **above** 'Clear Threshold Alert Level - Amber' threshold of 75,000, so its status is set to Green.
2. A transaction occurs that decreases liquidity by 35,000 so it decreases below the 'Clear Threshold Alert Level - Amber' threshold (75,000). Note its status remains Green because it has not yet decreased below the 'Threshold Level - Amber' value of 50,000.
3. Another transaction occurs that decreases liquidity by another 35,000. So now it decreases **below** the 'Threshold Level - Amber' value and the liquidity status becomes 'Amber'.

## Scenario 2 - Liquidity Reaching Green status from Amber status:

75,000 - (50,000 + [50% of 50,000])

= Clear Threshold Alert Level - Amber

50,000 - Threshold Level - Amber

= Clear Threshold Alert Level - Amber

25,000 (status = Amber)

= Clear Threshold Alert Level - Amber

+ 35,000

= Clear Threshold Alert Level - Amber

+ 35,000

= Clear Threshold Alert Level - Amber

60,000 (status = Amber)

= Clear Threshold Alert Level - Amber

95,000 (status = Green)

= Clear Threshold Alert Level - Amber

1. Initially, the liquidity value is 25,000 which is **below** the 'Threshold Level - Amber' of 50,000, so its status is set to Amber.
2. A transaction occurs that increases the liquidity by 35,000 so it increases above the 'Threshold Level - Amber'. Note its status remains Amber because it has not yet increased above the 'Clear Threshold Alert Level - Amber' value of 75,000.
3. Another transaction occurs that increases the liquidity by another 35,000. So now it increases **above** the 'Clear Threshold Alert Level - Amber' and the liquidity status becomes 'Green'.

## Conclusion

Between Scenario 1 and Scenario 2, we can see there are cases where, when we only have the summary information e.g. the "closing balance" is taken when the Liquidity is at 60,000, then we don't have all the information to calculate exactly what the liquidity status might be (whether Amber or Green), because that depends on which threshold it last crossed, and in which direction [increasing or decreasing].

For CI Portal to report status, using only the inputs: Closing Balance, current value of 'Amber Liquidity Threshold', and calculated current value of 'Clear Threshold Alert Level - Amber' (based on current value of Clear Amber threshold percentage), it is not possible to correctly calculate the current status the liquidity position may have if it lies between these two thresholds, because it may have arrived at this value by an event that decreased it 'from above' or increased it 'from below'.

## Proposal

We propose that, for CI Portal, the current 'Amber' or 'Green' status is not important to report on for closing balance when it is within this range, because it may have either status. It should be acceptable to only report that the balance is between the thresholds, and not required to report an exact status (it may be considered as being at 'Green/Amber' status), when it falls between these two thresholds.

## Notes

in descriptions given, 'above' means '>' (greater-than), not '>=' (greater-than or equal to).

in descriptions given, 'below' means '<' (less-than), not '<=' (less-than or equal to).

*Refers to CI Hub product configuration definitions and calculations involving defs 'clearPct' and 'clearAmberAmt' at:*

*[IP Business Pack Baseline]->Sessions->IP Liquidity Processing -> Processing Logic -> Perform Liquidity Operation -> liquidity-update -> Update Auth Liquidity Position (Hub)*