Summary

The aggregated calculations became very powerful in Zabbix 5.4, but it's still not possible to count a number of values returned by *_foreach() functions. Having an aggregate count (not to be confused with a history function count) would benefit Zabbix users.

Use cases

1. I want to count the number of different entities (items, hosts) that satisfy specific criteria in an aggregate context. For instance:
    a. Count the number of specific items discovered by LLD and receiving data.
    b. Count the number of hosts in a host group having a specific item.

Zabbix acceptance

1. The following new functions must be introduced for aggregate calculations:
    a. A new aggregate function count():
        i. It must only support foreach functions as the only argument (e.g. count(last_foreach(/host/key[*])))
        ii. It must return the number of values returned by foreach function
            1. It must return 0 if there is no data
    b. A new foreach function exists_foreach(item_filter):
        i. It must support the same item filters as other foreach functions
        ii. It must return an array of integer constants '1'; every constant corresponds to one match in the item filter
            1. Example: there are items net.if.in[eth0], net.if.in[eth1], net.if.in[eth2] in Host1, exists_foreach(/Host1/net.if.in[*]) returns [1, 1, 1]
    c. A new aggregate function item_count(item_filter):
        i. It is an alias for count(exists_foreach(item_filter))
2. The front-end must add validation for formulas containing an aggregate count(), exists_foreach() and item_count()

Zabbix UI changes

1. N/A

Nonfunctional requirements

1. Aggregate count() must share code with history count()
2. exists_foreach() must only work with configuration and not read history
3. Documentation must make clear that:
    a. item_count() is a shortcut for count(exists_foreach())
    b. there are performance implications of using count(max_foreach(//key[*])) and other history-related foreach functions (in contrast with exists_foreach())

Decisions made

1. Do not limit argument of count() to only last_foreach(), support all *_foreach() functions.
2. Do not support optional constants in exists_foreach() (always return '1's).
3. Do not support filtering by item attributes (such as type, status etc) at this time.

Open questions

1. N/A

Changes log

- 1.1
  - Added exists_foreach() and item_count() functions
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