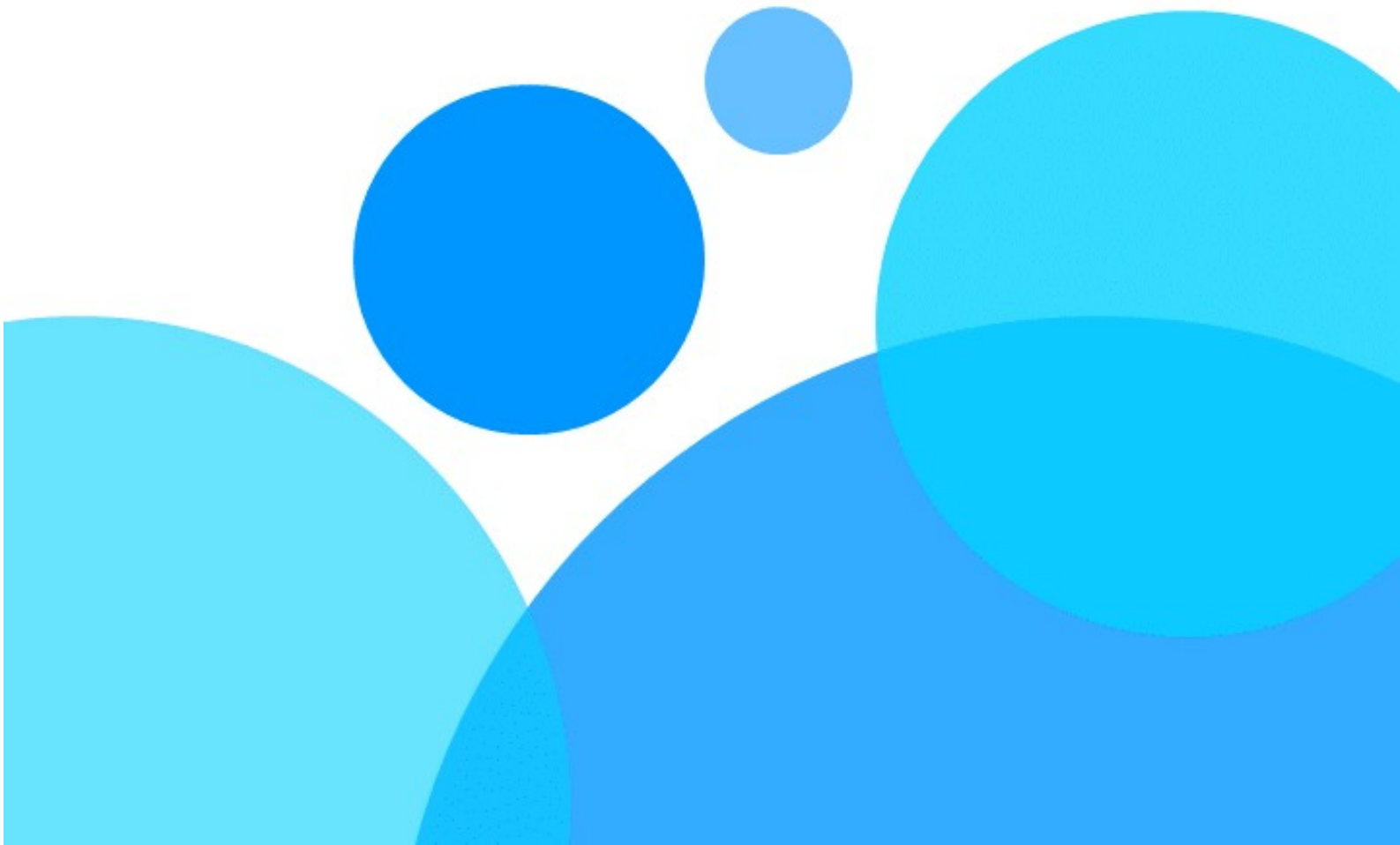# Freely unleash the potential of data

FineBI V5.1.5 spider performance test report

Document version.	V1.0
Last updated on.	2020-09-04
Author.	Performance Testing Group
Creation Date	2020-08-17

Revision record.

Versions	Modify date	Change Description

Catalog

1、Overview

1.1，Purpose

Summarize and report on the performance of FineBI 5.1.5 spider version.

1.2，Background

FineBI 5.1.5 released with accompanying performance test reports

1.3，noun description

Noun	Description
①Original table	Update to the original table (added db database table, sql dataset or Excel dataset) in the BI engine.
②Results Table	The result set of a self-help dataset, or a table made in a Dashboard (Dashboard).
③ Number of concurrent users	The number of users who send service requests at the same time (different from the number of registered users and online users).
④ Calculation request	Requests that require engine computation, data and page requests when previewing or editing.
⑤ Non-calculated requests	Requests other than data/page when logging in, entering data preparation/dashboard, previewing, or editing.
⑥90%Line	90% of the sample time did not exceed this value.

1.4，Range

This test focuses on the performance of 5.1.5 for data source updates, self-service datasets, dashboard preview, concurrency, and platform.

1.5，Conclusion

- The chart optimizes the big data model and reduces the risk of downtime.
- The update optimizes the edited raw tables to take a streaming extraction, and improves update performance by 40%.
- Other single, concurrent scenarios performance and recommended configurations are consistent with version 5.1.3.

2、Testing environment

2.1，test network
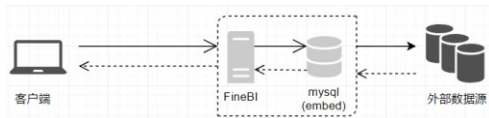
Note: All machines are on the same LAN, which excludes the influence of network factors on the system.

2.2，server configuration

Application Deployment	Server Address	Operating System	CPU	Number of physical cores	Logical cpu number	Memory	Disk Type
FineBI	188.168*218	CentOS 7	2 Intel(R) Xeon(R) CPU E5-2620 v4 @ 2.10GHz	2*8	32	64G-96G	2T (mechanical)
Mysql Configuration Library	188.168*216	CentOS 7	2 blocks Intel(R) Xeon(R) CPU E5-2620 v4 @ 2.10GHz	2*8	32	64G	2T (mechanical)
GreenPlum Data Source Library (3 units)	188.168*100 188.168*105 188.168*106	CentOS 7	1 Intel(R) Core(TM) i7-6800K CPU @ 3.40GHz	1*6	12	128G	2T (mechanical)
Jmeter Negative Carrier	188.168*11	Windows 7	1 block Intel(R) Core(TM) i7-3770 CPU @ 3.40GHz	1*6	6	20G	300G (Machine machinery)

2.3，database configuration

Database Type	Test scenarios	Versions and parameters
Mysql Version	Concurrent	5.7 innodb_buffer_pool_size=1G innodb_log_file_size=48M max_connections=1000

Greenplum	Distribu ted	PostgreSQL 8.3.23 (Greenplum Database 5.3.0 build commit:2155c5a8cf8bb7f13f49c6e248fd967a74fed591)

2.4, FineBI Configuration

FineBI Versions	Version 5.1.5 (August 4, 2020)
jvm memory	16G
Tomcat thread count settings (server.xml)	maxThreads="500" minSpareThreads="100" maxSpareThreads="200" acceptCount="500"
Configuring library connection pools (db.properties)	hibernate.initialSize=50 hibernate.maxActive=150

3、Test content and method

3.1, test range

- Data source related, raw tables (full, incremental, post-edit), linked updates, self-service datasets, global updates.
- Single-user request length, core order of magnitude scenario response length.
- Self-service datasets, previews of dashboards (Dashboard), editing concurrency.
- The length of single-user requests for common platform scenarios.
- Login, directory tree, user management view, permission management view, view message concurrency.

3.2, test content

Core order of magnitude description.
- Raw table update data, 1 million to 100 million.
- Raw table data, processing of 10 million rows for users, and analysis of 1 million rows for users.
- The schedule contains 20 columns and 100 columns.
- Grouping table with 20 columns, all 10 dimensions and 10 indicators. The number of rows of results in the grouping table is 10,000 and 300,000.

Number of rows of updated data in the	1 million ~ 1 billion

original table	
Processing user-original table data rows	1 million
Analyze the number of rows of user-original table data	1 Million
Number of groups (number of rows of grouped table results)	10,0 00	300,0 00
Number of data columns (results table_summary)	20(10 dimensions + 10 indicators)	
Number of data columns (result table_detail)	20	100

3.2.1，dashboard (table) scenarios

1、Basic characteristics

Characte ristics	Desc ript ion
Subgroup Summary	median, variance, standard deviation, number of records, averaging, ring period value, ring period ratio Maximum value
Customized grouping	Custom grouping + number of de-duplicated records/median
Totaling Method	Calculate the results of the index formula and sum up the results
	Find the mean total, minimum total, median total, and median total for the index formula calculation results. Total standard deviation, total variance
	Totaling method (default auto)
Number of de-duplicated records	Number of de-duplicated records + table header filtering / totaling method / grouping summary / quick calculation / sorting
Year Month Interval	Year-Month Interval Controls, Year-Month Interval Controls Detail
Controls and dimensions sorted by other fields	Dropdown tree dropdown operation, grouping table display
	Control sorts by other fields (text drop-down, ascending order)
	Text drop-down operation
	Custom sorting of control bound fields

	Row header fielda Ascending order by associated fieldb
Control option values support filtering	Drop-down tree drop-down operation, grouping table display
	Control option values support filtering (text dropdown endings are)
	Belongs to 50, 100 Dropdown tree dropdown operations
	Control option values support filtering (text dropdown belongs to 50, 100 items)
	Control binding field filtering first 10, 50, 100 dropdown tree dropdown operations, display
Schedule filtering support TopN	First 1000, 10w, 100w bars
Component Filtering	Detailed components, summary components belong to 50, 100 items
	Detailed, grouped indicators filtered by text fields ending in
	Detailed and summary date fields are set to not be between two dates
	Detail, Summary 1 numeric field set between two numbers
	Dimension field filtering belongs to 50, 100 items
	The grouping dimension filters the endings based on a dimension field that is
	Grouping table dimension fields to filter the first 10, 50, 100
	The dimensions filter the maximum 10, 50, 100 based on a metric
	Analysis of regional indicators set to filter the maximum of 10, 50, 100
Multi-indicator filtering	Multi-indicator filtering + custom grouping / calculate indicator to dimension / table header filtering / sorting / multi-group Pieces
Linkage	Indicator linkage operation
	Linkage passing filter conditions, indicator detail filtering
	Dimensional linkage operation
	Linkage delivery table header dimension filtering, table header indicator filtering
	Indicator dimension linkage
	Indicator dimension linkage operation
Jump	Detail table jumps to detail table, grouping table, passing reference, not passing reference
	Grouping table jump to grouping table, detail table, passing reference, not passing reference

	Detail table, grouping table jump to web link to pass reference, not pass reference
Filtering to calculate sorting priority	The cumulative value is calculated after sorting
	All values, all values within a group are performed after dimensional filtering, no secondary computation
	Cumulative values, cumulative values within groups, secondary calculation after dimensional filtering
	Ranking and intra-group ranking are performed after dimensional filtering and are not calculated twice

2、Functional characteristics

Char acte rist ics	Desc ript ion
Basic Functions	Addition, subtraction, multiplication and division
Aggregation functions	Sum_agg, Avg_agg, Max_agg, Count_agg, Countd_agg, Median_agg, Stdev_agg, Var_agg
Quick Calculation Functions	Same period value - year, month (SAME_PERIOD)
	Ring period value - year, month, day (PERIOD_ANLS)
	Ranking of all values, all values in a group (RANK_ANLS)
	Summation of all values, all values in a group (ACC_SUM)
	Calculate all values across rows, all values in a group, sum, average, maximum, minimum Value (TOTAL)

3.2.2, dashboard (chart) scenarios

1、Basic characteristics

Majo r Cate gori es	Chart Subcateg ories	Display adaptation mode
Polar coordinate system graphs	Radar diagram	Standard adaptation
Right angle axis system graph	Heat points, funnel charts, dashboards, filled maps, text, pie charts, rectangular blocks, points, bar charts, lines, areas	Standard adaptation
		Standard adaptation, holistic adaptation
Non-rectangular coordinate system graphs	Pie charts, funnel charts, rectangular tree blocks, aggregated bubbles Charts, multi-layer pie charts,	Standard adaptation

	word clouds	
Geographical coordinate system graphics	Point map, heat map, flow map	Standard adaptation

3.2.3, self-service dataset scenarios

3.2.3.1 Order steps

Char acte rist ics	Desc ript ion
Subgroup Summary	median, variance, standard deviation, averaging, ring period value, ring period ratio, number of records De-duplicate number of records, maximum value, custom grouping, summation
Sort by	Fractional, integer, text, date, 4 field, 5 field
New column	Time difference, acquisition time, all values, all values in group, accumulated values, accumulated in group value, ranking, group ranking, group assignment text, group assignment value, formula
Filtering	Text belonging to 100 items, the first 10, 00 of the largest value, the first 10, of the latest date 100, text endings are, values between, average filter, non-empty, formula
join	Intersection merge, left merge, right merge, merge set merge
union	Top and bottom merge
Field Settings	Change name, cancel field
Functions add columns/filter	ABS, ACOS, AND, ASIN, ATAN2, ATAN, CEILING, CHAR, CODE, CONCATENATE, COS, DATEDELTA, DATEDIF, DATESUBDATE, DATETONUMBER, DATE, DAYS360, DAYSOFMONTH DAYSOFQUARTER, DAYSOFYEAR, DAYVALUE, DAY, DEGREES, ENDWITH, EXACT, EXP, FACT, FIND, FLOOR, FORMAT, HOUR, IF, INDEXOF, INT, ISNULL, LEFT, LEN, LN. LOG10, LOG, LOWER, LUNAR, MAX, MID, MINUTE, MIN, MOD, MONTHDELTA, MONTH, NOW, NUMTO, NVL, OR, PI, POWER, PROMOTION, PROPER, RADIANS, RANDBETWEEN, RAND REGEXP, REPEAT, REPLACE, RIGHT, ROUND, ROWN, SECOND, SIGN, SIN, SQRT, STARTWITH, SUBSTITUTE, SWITCH, TAN, TIME, TODATE. today, todoble, tointeger, trim, trunc, upper, weekdate, weekday, week, yeardelta, year

3.2.3.2 Multi-step

Characte ristics	Desc ript ion
	Top and bottom merge + group summary
	Field Settings + Group Summary
	Left-right merge + group summary

Multi-step	Sort + Group Summary
	Filtering + Grouping Summary
	Filtering-Mixed Functions, Formulas
	New column-mixed functions, formulas
	Left-right merging + grouping summary (ring period) + sorting
	Merge left and right + filter + group summary (median) + sort + add new columns
	Merge left and right + filter + filter + sort
	left-right merge + add new column + filter + add new column + ring-period ratio + sort
	Left-right merge + flow multi-filter
	Left-right merge + memory multi-filter
	Left and right merge + group summary + 3 new columns + filtering + field settings + sorting
	1 New column + 4 Filtering
	2 Add Columns + 4 Filtering
	1:1 Custom Grouping + Filtering
	Filtering + Grouping Summary (same period)
	1:1 custom grouping + average filtering
	Group Summary + New Column
	Left-right merging of two complex self-help datasets

3.2.4，update scenes

Characteristics	Number of table rows	Number of table columns
Original form table update	1 million~100 million	20~400
Incremental Updates	1 million~100 million	20~100
Related Updates	1 million~100 million	30~400

Self-service dataset update	1 million~100 million	20~100
Global Update	1 million~100 million	20~100

3.2.5, query concurrency scenarios

Preview most frequently previewed dashboards 10 + Edit most frequently edited dashboards 10 + Edit most frequently edited datasets 9
The sheets are combined into a mixed scenario with different concurrency numbers in the ratio of 3:1:1 to find the maximum number of concurrency that the system can support.

@Fanruan Software CO,.Ltd.

3.2.6，platform base scenarios

Characteristics	Description
Catalog Management	Add template, bulk mount, bulk delete, FR file directory tree
User Management	Query user, department position, role, edit user, department position, role, platform use user select all, empty, expand department structure tree, add user, delete user, bulk delete user, empty user, import user, synchronize with household
Permission Management	Search for departments, roles, people, directories, configure revocation of permissions (departments, roles, users), permissions quick configuration
Platform Log	View access statistics, user behavior, template hotness, and performance monitoring. Management logs, error logs

3.2.7，platform concurrency scenarios

Characteristics	Description
Catalog	Platform View Directory Tree Interface
Login	Concurrent login for normal users
Message Notification	Click to see the little bell

3.3，Testing Tools

Single scenario: browser
chrome; concurrent:
jmeter crush test tool.

4、Test results and analysis

Note: The test results are all single-user operations, with no data generation tasks in the background (response time will slow down when there is data generation or concurrency).

4.1, Dashboards (Forms)

4.1.1 The length distribution of basic scene preview

Test scenario description.

- Test templates for combined scenarios involving the content of section 3.2.1 for function points.
- The page preview length is affected by the number of rows in the original table, the number of rows in the result table (grouped tables correspond to the number of groups), the number of columns in the result table, etc.

Order of magnitude description.

- Raw tables using DB/sql tables with 10 million rows/ 100 million rows of data.
- The schedule contains 20 columns and 100 columns.
- The base scenario was created with a grouping table of 20 columns, all with 5 dimensions and 15 indicators. The number of rows in the grouping table is 100, 10,000, and
  1 million.
- The function scenario produces a grouping table with 10 columns, all 5 dimensions and 5 indicators. The number of rows in the grouping table is 10,000.

Test results.

- Base scenario 10 million orders of magnitude, a total of 363 test results, of which 86.78% scenarios within 3 seconds to display, 10.47% scenarios 3 ~ 6 seconds, 2.75% scenarios 6 ~ 15 seconds; scenarios greater than 3 seconds are: grouped summary ring period value, grouped summary ring period ratio, row table header fields sorted by associated fields, aggregation method, filtering calculation sorting superior
  Precedence, TopN filtering.
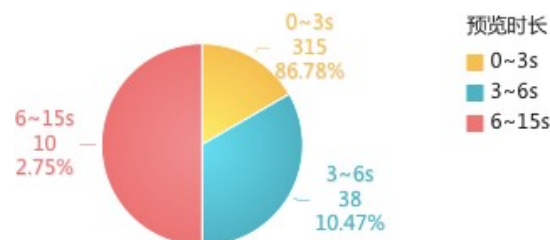
- Under the base scenario 100 million order of magnitude, there are 343 test results, of which 58.02% scenarios are displayed within 3 seconds, 19.3% scenarios 3~6 seconds, 15.45% scenarios 6~15 seconds, 6.71% scenarios 15~30 seconds, 0.29% scenarios greater than 60 seconds; scenarios greater than 3 seconds are: grouped summary ring period value, grouped summary ring period ratio, row table header fields according to the associated fields sorting, totaling method, filtering to calculate sorting priority, and TopN filtering.

14
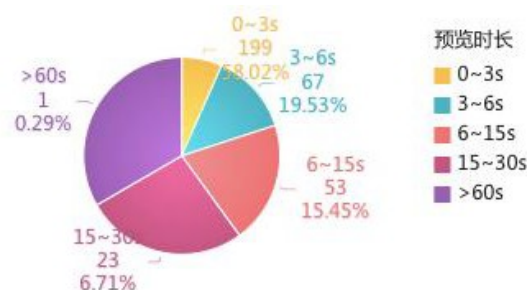
- Functions: 10 million orders of magnitude, a total of 86 test results, of which 76.74% scenes are displayed within 3 seconds, 11.63% scenes 3 to 6 seconds, 11.63% scenes greater than 6 seconds; functions greater than 3 seconds are: DAYS360, DATESUBDATE, FACT, SWITCH, ROUND, LOG, DATEDIF, DAYSOFQUARTER, LN, LOG10, ABS, EXP, YEAR, DAYSOFMONTH, MONTH, AND, DAYSOFYEAR
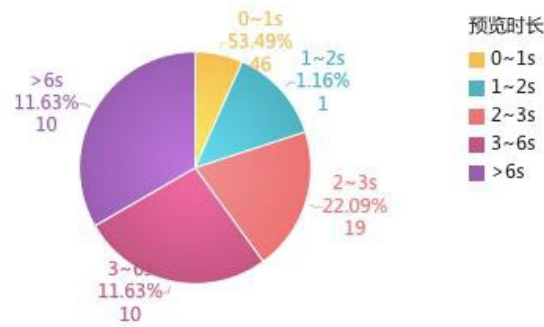
Scenes	Order of magnitude	Response time	Number of records	Percentage of
Basic scenes	1 million	Within 3 seconds	315	86.78%
		3~6 seconds	38	10.47%
		6~15 seconds	10	2.75%
Basic scenes	100 million	Within 3 seconds	199	58.02%
		3~6 seconds	67	19.3%
		6~15 seconds	53	15.45%
		15~30 seconds	23	6.71%
		Greater than 60 seconds	1	0.29%
Function	1 million	Within 3 seconds	66	76.74%
		3~6 seconds	10	11.63%
		More than 6 seconds	10	11.63%

● **Scenarios with weak performance**

Scenes	Number of original table rows	Number of columns in the result table	Number of groups
Subgroup Summary - Ring Period Value, Ring Period Ratio	10 million, 100 million	20	1 million
Component Filtering - TopN Filtering	10 million, 100 million	20	1 million
Filtering to calculate sorting priority	10 million, 100 million	20	1 million
Aggregate - median, variance, standard deviation, averaging, minimum Value	10 million, 100 million	20	1 million
Row header fielda Ascending order by associated fieldb	10 million, 100 million	20	1 million

Functions-DAYS360, DATESUBDATE, FACT, SWITCH, ROUND, LOG, DATEDIF, DAYSOFQUARTER, LN, LOG10, ABS, EXP, YEAR, DAYSOFMONTH, MONTH AND、DAYSOFYEAR	1 million	20	1 million

Functions-DAYS360, DATESUBDATE, FACT, SWITCH, ROUND, LOG, DATEDIF, DAYSOFQUARTER, LN, LOG10, ABS, EXP, YEAR, DAYSOFMONTH, MONTH AND、DAYSOFYEAR	1 million	20	1 million

4.1.2, portfolio scene preview time distribution

Test scenario description.

- Test templates involving function points for combined scenarios of the single scenario in section 3.2.1.
- The page preview length is affected by the number of rows in the original table, the number of rows in the result table (grouped tables correspond to the number of groups), the number of columns in the result table, etc.

Order of magnitude description.

- The original table uses a self-service dataset with 10 million rows of data
- Detailed table with 20 and 100 columns
- The base scenario was created with 25 columns of grouping tables, all with 10 dimensions and 15 indicators. The number of rows in the grouping table is 10,000, 300,000

Test results.

- 10 million orders of magnitude: there are 231 test results, of which 67.97% scenarios are displayed within 3 seconds, 12.55% scenarios 3~6 seconds, 13.42% scenarios 6~15 seconds, 1.73% scenarios 15~30 seconds, 3.9% scenarios 30~45 seconds, 0.43% scenarios more than 60 seconds; scenarios more than 3 seconds are: cross-tabulation, number of de-duplicated records + table header filtering, filtering Calculate sorting priority, group summary ring period value, group summary ring period ratio
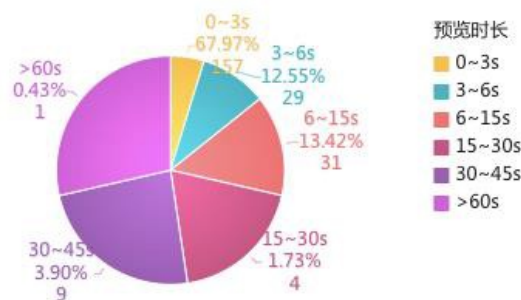
Number of original table rows	Response time	Number of records	Percentage of
	Within 3 seconds	157	67.97%
	3~6 seconds	29	12.55%
	6~15 seconds	31	13.42%

1 million	15~30 seconds	4	1.73%
	30~45 seconds	9	3.9%
	Greater than 60 seconds	1	0.43%

● **Scenarios with weak performance**

Sub-characteristics	Description	Number of original table rows	Number of columns in the result table	Number of groups
Subgroup Summary	Ring period value	1 million	25	300,000
	Ring Period Ratio	1 million	25	300,000
Cross-tabulation	Addition, subtraction, multiplication and division calculation index	1 million	25	
	TopN Filtering	1 million	25	
	Filtering to calculate sorting priority	1 million	25	
Number of de-duplicated records	Number of de-duplicated records + table header filtering	1 million	25	10,000/300,000

4.1.3, Export Excel file

Test scenario description.
Default is exported as the default summation of metrics, with computational

scenarios selected for testing in section 3.2.1 with poorer performance; Order

	Schedule	Grouping Table	Cross-tabulation
Number of original table rows	1 million~10 million	5 million~10 million	5 million~10 million
Number of groups		350,000	Rows 300*Columns 1200
Number of columns in the result table	20	20~50	20

Test results.

Version 5.1.5 has the same performance as version 5.1.3, with the following results.

4.1.3.1, Schedule

- The extracted raw tables are exported in about 42w cells per second, and 2kw cells can be exported in 1 minute.
- (a) In a fixed configuration, the length of the export is mainly affected by the number of cells exported.
- The time difference between exporting a large volume of data after filtering and exporting the original table with the same volume of data alone, the main time difference being the time taken to execute the filter conditions.
- CPU and memory usage is mainly determined by the number of cells in the template, and the overall usage is low.

Number of rows	Number of columns	Number of cells	Export Method	Export duration s
100w	20	2kw	Single Table Export	47
			Global Export	48
1kw	20	2ww	Single Table Export	492
			Global Export	486

4.1.3.2, grouping table

- The default summation scenario with a base table of 10 million rows and 350,000 groups exports about 26w cells per second, and the calculation scenarios can all be completed within 1 minute.
- (a) The length of the export is mainly affected by the number of groups, columns and calculation methods, while the total number of rows has a relatively small impact.
- CPU and memory usage is mainly determined by the number of groupings and computational complexity of the template, and the overall usage is high.

Original table row-column-group	Calculation method					
	Calculation of indicators (COUNTD_AGG)s	Calculation of indicators (COUNT_AGG)s	Aggregate for medians	Aggregate for variances	Aggregate ring seeking periods	Default summation s
500w-20col-35w	21.85	19.65	23	22.49	24.73	20.76
1kw-20-35w	24	20	24	20	26	20
1kw-50-35w	66	43.97	56.59	41.40	45.42	43.92
1kw-20-100w	57.07	47.21	59.54	51.37	66	56.42

4.1.3.3, cross-tabulation

- Exporting 30w cells per second for a default summation scenario with a base table of 10 million rows, 300 row groupings, and 1200 column groupings.
- (a) The length of the export is mainly affected by the number of row groupings, column groupings and calculation methods, while the total number of rows has a relatively small impact.
- CPU and memory usage is mainly determined by the number of groupings and computational complexity of the template, and the overall usage is high.

Number of original table rows / length of export	Row grouping - Column grouping - Number of indicators		
	100 row grouping - 3 column grouping -5 Indicators	300 rows grouped - 1200 colums Subgroup-10 Indicators	32100 Row grouping - 1200 Column Grouping-10 Indicators
1kw	2.15s	12.7s	11min
500w	0.925s	11.32s	10.9min

4.1.3.4，concurrent export

With a fixed configuration, the fewer the cells, the lower the number of groups, and the simpler the calculation the greater the maximum number of concurrency supported by the system.

Form Type	Number of cells	Maximum number of concurrent support
Schedule	1 million	110
	2 million	100
	100 million	10
	200 million	5

Form Type	Number of groups	Number of original table rows	Maximum number of concurrent support
Grouping Table	10,000	5 million	120
		1 million	100
	350,000	5 million	100
		1 million	70
	1 million	5 million	30
		1 million	10
	2.8 million	1 million	5
Cross-tabulation	100 Row Grouping - 3 Column Grouping - 5 Indicators	5 million	120
		1 million	100
	300 row grouping - 1200 column grouping -10 Indicators	5 million	30
		1 million	30
	31200 Row grouping- 1200 Column grouping-10 Indicators	5 million	5
		1 million	5

4.2, Dashboards (Charts)

4.2.1, Big Data Model Introduction

● Calculation with all data, when the amount of data specified in the big data mode is reached, the big data mode is triggered, and the first limited number of entries after the calculation of all data is taken according to the limited display data volume is plotted and displayed.

● (a) The fetching calculation and the plotting of the big data model are executed in the background and finally sent to the front-end in the form of images.

● (a) Front-end plotting mode is used when the big data model is not triggered, where the fetching calculation is performed in the background and the plotting is done in the front-end.

23

- The default big data mode concurrency number is 3 in version 5.1.5. You can specify the big data mode concurrency value through the parameter with the id of SystemOptimizationConfig.chartBigDataNum in the FINE_CONF_ENTITY table of the configuration library, and use the front-end drawing method for accessing big group templates over the concurrency number. (Note: it is recommended not to modify, to avoid taking up too much memory to increase the risk of downtime).

4.2.2, chart overall restriction logic

Note: The maximum export limit is 30,000 data.

Chart Broad Category	Chart Type	Display Method	Limit the amount of data displayed
Polar coordinate system	Radar map	F r o n t - e n d d r a w i n g display	1 thousand
Geographical coordinate system	Point map, heat map, flow map		No restrictions
Non-rectangular coordinate system	Pie charts, funnel charts, rectangular tree blocks, aggregated bubble charts, multi-layer pie charts, word clouds		5K
Cartesian coordinate system	**Bar graph, line graph, point graph, area graph**, satisfying one of the following conditions. 1、The horizontal and vertical axes include one or more dimensional indicator fields, and the dimensional indicator fields are in different horizontal and vertical axes, the maximum number of horizontal and vertical dimensional fields is 2, and a single indicator Up to 4 chart attribute fields under the label. 2、The horizontal and vertical axes include one or more dimensional indicator fields, and the dimensional indicator fields are in different horizontal and vertical axes; other dimensional or indicator fields are in non-horizontal and vertical positions, and the maximum number of horizontal and vertical dimensional fields is 2, and the chart attribute fields under a single indicator The maximum number of segments is 4. **Point diagrams that** satisfy one of the following conditions. 1. one or more indicator fields on the horizontal and vertical axes, respectively; other dimensions or indicator fields in non-horizontal and vertical positions, up to 4 chart attribute fields under a single indicator. 2, horizontal and vertical axes have one or more dimensional fields, respectively, horizontal and vertical or longitudinal axis Maximum of 2 dimension fields and maximum of chart attribute fields under a single indicator.	5 t h o u s a n d g r o u p i n g s t r i g g e r the display of b i g d a t a p a t t e r n s, below 5 t h o u s a n d g r o u p i n g s f o r f r o n t - e n d mapping display	1. the standard adaptation display limits the display of 300,000 data. 2 、 Width adaptation, height adaptation, overall adaptation display show 100,000 data (thermal point limit display 50,000 data).
	Point (not the above scenario), bar graph (not the above scenario), line (not the above scenario), area (not the above scenario), heat point, funnel graph, gauge Plate, fill map	F r o n t - e n d d r a w i n g display	5K

4.2.3, base scene preview length

Test scenario description.

● Test templates involving function points containing various diagrams, with detailed scenarios as described in section 3.2.2.

● the length of the page preview is affected by the number of rows of the original table, the number of rows (groupings) of the result table, the number of columns of the result table, etc..

● Grouping logic: All dimension fields in the analysis area are involved in the fine-grained (grouping) division, and the division logic is the same as the grouping table logic, that is, the effect of dragging in dimension fields in the attribute area is equivalent to dragging in dimension fields in the grouping table; the grouping order is from left to right, from top to bottom, and the horizontal and vertical axes take precedence over the attribute panel.

Order of magnitude description.

● Raw tables using DB/sql tables with 10 million rows of data.

● The number of subgroups for all scenario production includes: 500 subgroups, 5000 subgroups, 30,000 subgroups, 1,000,000 subgroups.

● All scenarios use dimension fields including: 2 dimension fields, 3 dimension fields, 5 dimension fields.

● All scenarios use 1 indicator field.

Test results.

● 10 million orders of magnitude, a total of 128 test scenes, **35.**16% of which are within 3 seconds, **17.97%** of which are 3-5 seconds, **24.22% of which are** 5-10 seconds, **11.72% of which** are 10-15 seconds, and **10.94%** of which are more than 15 seconds.

- Some of the 30K and 1M groupings have improved performance compared to version 5.1.3, mainly because the scenario was changed from 5.1.3

  of the big data model into one that uses front-end mapping and limits the amount of data displayed to 5,000.

- The 5k grouping templates for the filled map and dashboard in the Cartesian coordinate system are displayed in this version using front-end mapping, which is more efficient than

  Version 5.1.3 is about 5s slower, and is still being optimized.

- The overall trend distribution is as follows.
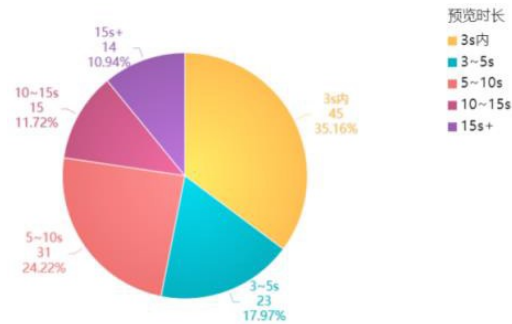
Number of original table rows	Response time	Number of records	Percentage of
1 million	Within 3 seconds	45	35.16%
	3~5 seconds	23	17.97%
	5~10 seconds	31	24.22%
	10~15 seconds	15	11.72%
	More than 15 seconds	14	10.94%

4.2.4, weaker performance scenarios

Major Categories	Chart Subcategories	Display adaptation mode	Number of groups	Response time s
Polar coordinate system graphs	Radar map		1 million	5~6
Geographical coordinate system graphics	Point map, heat map, flow ground Figure		1 million	8~10
	Aggregate Bubble Chart	Standard		5~7

		adaptation	5000, 30,000, 100 million	6~21
Non-rectangular coordinate system graphs	Multi-layer pie chart			
	words and clouds			11~16
	Funnel charts, pie charts, rectangular tree blocks		1 million	5~8
Right-angle coordinate system graph	Fill map, dashboard		5000, 30,000, 100 million	13~35
	Funnel diagram, thermal point, line, point Rectangular blocks, areas, pie charts		30,000, 1 million	6~32
	Area, funnel chart, text, bar Figure		1 million	5~16
	Area, funnel map, filled map	Overall adaptation	5000, 30,000, 100 million	5~27
	Rectangular blocks, areas, bar graphs, meters Dials, lines, dots		30,000, 1 million	6~18
	Pie charts, heat points, text		1 million	5~11

4.3, data preparation

4.3.1, Updates

● 5.1.5 The update performance of raw tables (full, incremental), associations, and self-service datasets is generally consistent compared to 5.1.3.

● 5.1.5 edited raw table updates using streaming extraction, 35% to 50% faster than 5.1.3 updates.

● Increasing jvm or using SSDs can have a definite impact on update speed.

4.3.1.1, full update of single table

Test scenario description.

● The data source library is greenplum, tested on database tables, sql data sets, focusing on update duration and update size.

● The update time of different projects is affected by the performance of the data source library (jdbc time consuming), the test environment results are for reference only.

Test results.

- The larger the original table the larger and more time-consuming the generated file.
- 10 million within 100 columns update within 10min, billion update more than 20min.

Characteristics	Number of rows	Number of table columns	Table Name	Update time min	Generate size G
Original form table update	1 Million	21	g100w_20col	0.27	0.47
	2 Million	21	g200w_20col	0.53	0.93
	5 million	21	g500w_20col	1.18	2.24
	1 million	27	v_t1kw_20col	2.22	3.22
		107	v_1kw_100col	6.15	6.88
	100 million	27	v_t1ww_20col	19.08	27.24
		107	v_t1ww_100col	57.71	62.87
	5 million large wide table	200	v500w_200col	3.93	7.43
		411	t500w_400col	21.35	21.68

4.3.1.2，single table incremental update

Test scenario description.
- The data source library is greenplum, and the incremental update test is performed on database tables and sql data sets (the incremental statement used for the test is select * from ...... where), focusing on the incremental update duration
- Because the update time is affected by the database performance (jdbc time consumption differences), the test results are for reference only.

Core order of magnitude description.
- Raw table data rows range: 5 million to 100 million rows.
- The number of columns in the original table data is mainly 20 and 100.

Test results.
- 3kw Incremental additions and deletions within a cell take less than 1min.
- The more the total number of cells, the slower the delete update time is compared to the increase.

Table Name	Number of incremental rows	Number of columns	Total number of cells	Increase update length min	Delete update length min
g500w_20col_load	137 w	20	2740w	0.33	0.8
v_t1kw_20col_load	200 w	20	4000w	0.48	1.25
gp100_v_t1ww_20col	2005 w	20	5ww	4.56	11.49
gp100_v500w_200col	250 w	200	10ww	2.64	10.96

4.3.1.3 Update the original edited table

Test scenario description.
- The data source library is greenplum, and the update test is performed on the edited database tables and sql data sets, with attention to the update duration.
- Because the update time is affected by the database performance (jdbc time consumption differences), the test results are for reference only.

Core order of magnitude description.
- Range of raw table data rows: 10 million rows.

- The number of columns in the original table data is mainly 20.

Test results.

- After 10 million raw tables are edited, the update time is optimized by about 35%~50% after the raw tables are extracted by streaming.

Table Name	Optimization time min	Update optimization ratio	Version history update length min	5.1.5 Version update duration
Cancel field display	4.35	38%	11.44	7.09
Numeric to text	6.52	39%	16.71	10.18
Numeric to date	6.43	35%	18.25	11.82
Text to Value	7.99	43%	18.35	10.36
Text to Date	8.15	37%	21.66	13.51
Date to value	7.84	50%	15.68	7.84
Date to text	7.27	49%	14.75	7.48

4.3.1.4, Association Updates

Test scenario description.

- The original table is configured with the association and updated. Focus on the update duration and update size of the association.
- The number of table data rows

covers tens, millions, and

Association Table	Affiliations	Data volume	Update time min	Generate file size M
g1kw_20col, v_t1kw_20col	1:1	10 million rows, 20 columns, 1,000 10,000 rows and 20 columns	0.74	77
V_Commodity reporting loss, D_Commodity	N: 1	1.29 million rows, 37 columns, 10,000 Rows 68 Columns	0.08	2.6
V_Total Sales, D_Merchandise	N: 1	50 million rows, 65 columns, 10,000 Rows 68 Columns	0.44	48
g50w_20col_up, v_t100w_20col	N: 1	500,000 22 columns, 1 million 27 columns	0.13	3.9
g500w_20col_up, v_t1kw_20col	N: 1	5 million 22 columns, 10 million 27 columns	0.84	39
g5kw_20col_up, v_t1ww_20col	N: 1	50 million 22 columns, 100 million 27 column	10.68	7168
v_t1kw_20col, kh_org_info	N: 1	1 million 27 columns, 3769 Rows 4 columns	1.14	20
g500w_20col_up, v_t1kw_20col		5 million 22 columns,		

31

4.3.1.5 , self-service dataset updates

Data processing users with self-service datasets in the order of 10 million can complete updates relatively quickly; data analysis users

The update can be done relatively quickly

at 1 million order of magnitude. **Test**

scenario description.

- Update testing with the self-service dataset scenario mentioned in section 3.2.3, focusing on the update duration and generated file size of the self-service dataset.

- Use the default configuration to test self-service dataset updates (if configuring the row index parameter, where the data processing user's (New columns, filtering, sorting, left-right merging of self-help data sets increase the speed of generation by about 35.4% and reduce the size of generated files by 47.62%).

- The update duration is affected by the computation time and the result set size, while the computation time is affected by the number of rows of the original table, the number of rows of the result table (The group summary corresponds to the number of groups), the number of columns in the result table, and other effects.

Note: The row index optimization parameter needs to be added to the fine_config_entity table of the configuration library: DistributedOptimizationConfig.spiderConfig.spider_row_index_strategy, with a value of true, the performance of a very small number of computationally intensive dashboards The preview performance will be reduced by about 30%.

Core order of magnitude description.

- Range of raw table data rows: 10 million to 100 million rows for data processing users and 1 million rows for data analysis users ~10 million lines.

- The number of columns in the original table data is mainly from 20 to 100 columns.

Test results.

The results of this part of the test are the results of the default configuration without the row index optimization parameters, as follows.

(1) Data processing user single-step scenarios.

- A total of 42 update time results were obtained for 10 million orders of magnitude, of which **79.55%** of scenes were updated within 1 minute. **20.45%** of the scenarios were updated within 2 minutes.

- The scenarios with 10 million orders of magnitude over 1 minute are mainly new column-ranking/group-ranking/cumulative value/accumulative value within group /Average all values/average all values within a group, top and bottom merge 1kw, intersection/right merge -1kw&1kw.
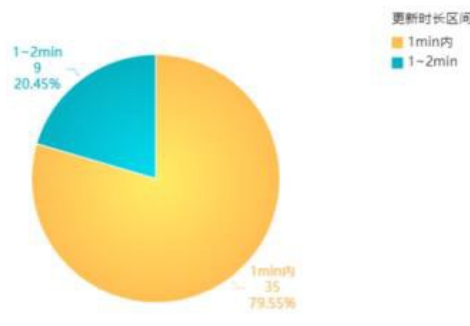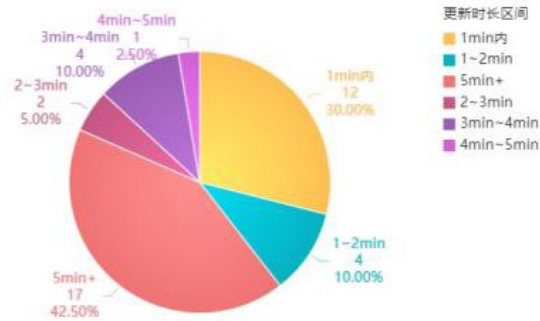

- 100 million orders of magnitude to obtain a total of 40 update time results, of

which **30%** of the scenarios updated within 1 minute.

27.5% of the scenes were updated within 1~5 minutes, **42.5%** of the scenes were updated in more than 5 minutes.

- The scenarios with 100 million orders of magnitude over 5 minutes are mainly all new column scenarios, sorting, merging sets and 1kw&1ww.
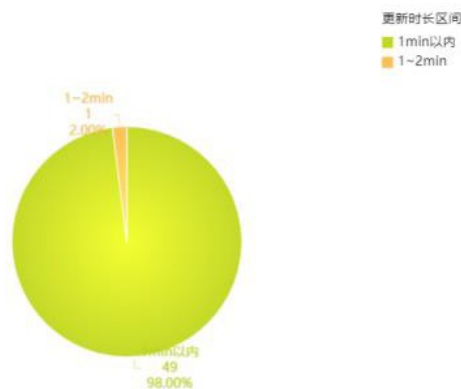
(2) Data processing user multi-step scenarios.

- A total of 63 update time results were obtained for 10 million & 100 million orders of magnitude, of which **71.43%** of scenes were updated within 1 minute. **20.41% of the** scenarios were updated in 1~5 minutes, 8.16% of the scenarios were updated in 5~10 minutes.

- Scenarios exceeding 1min are mainly larger or more left-right merging scenarios; the duration is affected by the computation time and result set size, while the computation time is affected by the number of rows of the original table, the number of rows of the result table (group summary corresponds to the number of groups), the number of columns of the result table, etc.
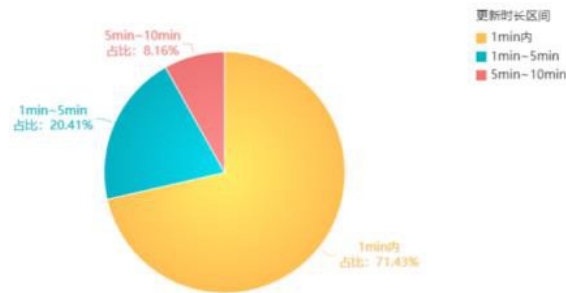
(3) Data analysis of user single-step scenarios.

- 1 million orders of magnitude to obtain a total of 52 update duration results, all scenarios can be updated within 1 minute.

- 10 million orders of magnitude in total to obtain 51 update time results, 98% of the scenarios can be updated within 1 minute, more than minutes of the scenario for filtering (text belongs to 50 items) - 10 million rows of 100 columns.
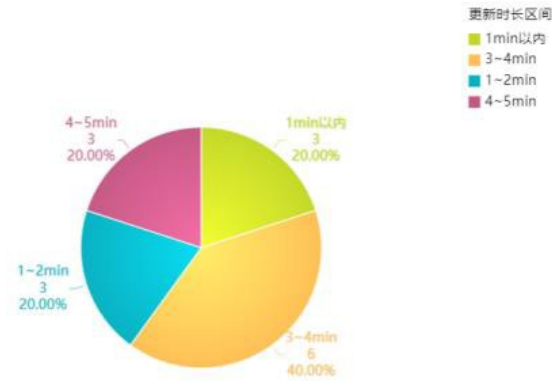

(4) Data analysis of user multi-step scenarios.

- 1 million order of magnitude total of 29 update duration results, all scenarios updated within 1 minute.

- A total of 15 update time results were obtained for 10 million orders of

magnitude. 20% of the scenes were updated within 1 minute, 20% within 1-2 minutes, 40% within 3-4 minutes, and 20% within 4-5 minutes.

4.3.1.6，Global Update

Test scenario description.
- Some of the test works were selected for comparative testing.
- Due to different data set scenarios and database performance differences, the test global update results are for reference only.

Test results.
- Same project with different memory: the more jvm allocations the shorter the update time.
- Different disks: Using a solid state drive increases global update performance by about 30% over a regular mechanical disk.

Project number	Number of data sets actually updated Number	Number of associations	Total db size	Memory	Overall update length
1.1	784	53	190G	16G	2h55min
1.2	349	102	238G	16G	4h28min
1.3	562	0	328G	16G	6h37min

4.3.2，self-help dataset editor

The self-service dataset is divided into data processing logic and quick analysis logic. Fast analysis allows for faster and more efficient analysis of millions of data.

4.3.2.1，data processing logic
- When editing the self-service dataset of the data processing logic, the first 2w rows are calculated by default, and a total of 802 calculation requests are counted, and more than 93% of the scenarios can be responded within 3s.

- Scenarios with poor performance are: group summary-ring period, median, filter-topN, ending yes, view text dropdown, custom grouping, and more steps.

Core order of magnitude description.

Scenes	Number of rows	Number of columns	Number of groups
Merge Scenes	Small table 10,000,000, 1,000,000, 5,000,000 Large table 5 million, 10 million 20~30	20~30	
The rest of the scenes	1 million	20~30	10 dimensions: 10,000, 300,000

(1) Single-step scenarios

Scenario Description: The self-help datasets are all single-step and involve only one function point, see Section 3.2.2 for detailed scenarios.

Self-service dataset editing test results.
- A total of 271 use cases were tested, and 552 computation requests were counted, of which **97.28% were** responded within 3s.
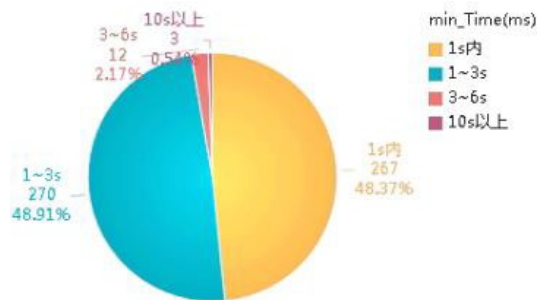
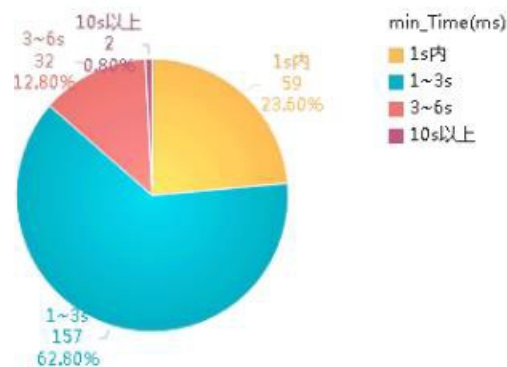- The default edit takes 2w data and the scenarios that **exceed 3s** are.

Scenes	Operation steps
Subgroup Summary - Ring Period Value, Ring Period Ratio, Median	View Summary Results
Filtering - Lateest date, largest value, text ending in	View Filter Results

(2) Complex scenes

Scenario Description: Self-service dataset is a combined scenario of multi-step-group summary, new column, filtering, sorting, merging, and field setting.

Self-service dataset editing test results.
- A total of 62 use cases were tested, and 250 computational requests were counted, of which **86.4% were** responded to within 3s.

- The default edit takes 2w data and the scenarios that **exceed 4s** are.

Scenes	Operation steps
Multi-table selection field + merge + add column + filter + add column + ring period ratio + row Preface	View intermediate steps
Merge + Group Summary + 3 New Columns + Filter + Field Settings + Sort	View intermediate steps
2 Add +4 Filtering	View intermediate steps
Merge + Filter + Group Summary + Sort + Add New Column	View intermediate steps
Grouped summary de-duplication count + new column ranking within group	View intermediate steps
Filter after a certain date + group summary for the same period	View intermediate steps
Left and right merge + filter	Text drop-down
Merge + Group Summary Ring Period + Sort	View intermediate steps
Left-right merging of two self-help datasets	View intermediate steps
Left-right merge + group summary	View custom groups

4.3.2.2, data analysis users

● When editing the self-service dataset of the fast analysis logic, all the data is taken by default and a total of 982 computation requests are counted, and more than **93% of the** scenarios can be responded within 3s.

● **Poor performance** scenarios are: grouping summary - ring period, median, sorting, viewing text dropdown, custom grouping, and more steps.

(1) Single-step scenarios

Scenario Description: Self-service data sets are single-step, involving only one function point, including grouping summary, adding new columns, filtering, sorting, merging, and field settings, see Section 3.2.3 for detailed scenarios.
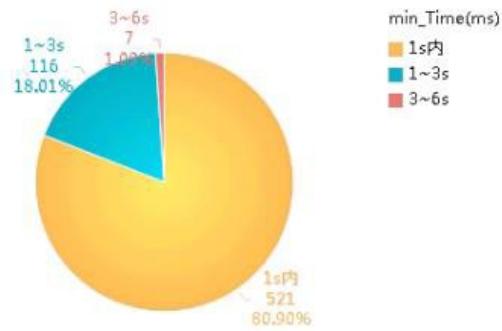
Core order of magnitude description.

Number of rows	Number of columns	Number of groups
1 million	20, 50, 100	10 dimensions: 10,000, 300,000

Self-service dataset editing test results.

● A total of 316 use cases were tested, and 644 computation requests were counted, of which **98.91% were** responded within 3s.

● The default is to take all the data, and the scenarios that **exceed 3s** are.

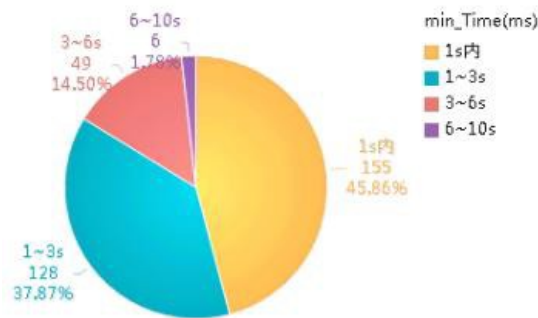| Scenes	Operation steps
Subgroup Summary - Ring Period, Ring Comparison, Median	View Summary Results
Sort by	View sort results for date+integer+decimal+text

(2) Complex scenes

Test scenario description.

- Self-service datasets as a combination of multi-step – grouping summary, adding new columns, filtering, sorting, merging, field setting Scenario.

Core order of magnitude description.

Number of rows	Number of columns	Number of groups
1 million	20, 50, 100	10 dimensions: 10,000, 300,000

Self-service dataset editing test results.

- A total of 79 use cases were tested and 338 computation requests were counted, of which **83.73% were** responded within 3s.

- Scenarios beyond the **4s** are.

Included Features	Operation steps
Left-right merge + group summary	View custom groups
Merge + Group Summary + 3 New Columns + Filter + Field Settings + Sort	View intermediate steps
Merge + Stream Multi-Filter	View intermediate steps
Merge + add columns + filter + add columns + ring period ratio + sort	View intermediate steps
Merge + Group Summary Ring Period + Sort	View intermediate steps
Merge + Memory Multi-Filter	View intermediate steps
2 Add +4 Filtering	View intermediate steps
Left and right merge + filter	Text drop-down

4.3.3, Excel data sets

Test scenario description.

Create a new Excel dataset, upload Excel/csv file from local, pay attention to the upload time, update time and generated size.

Order of magnitude description.

- Excel files with 10,000, 100,000, and 1,000,000 rows of data.
- The Csv file has 1 million and 15 million lines of data.

- The number of columns is 6, 20 and 100.

Test results.
- The excel file imports about 75w cells per second.
- The csv file imports about 350w cells per second.
- There is almost no difference in the speed of uploading excel/Csv datasets in version 5.1.5 compared to version 5.1.3.

Original Table Type	Number of original table rows	Number of columns in the original table	Upload time s	Update time min	Generate file size
excel table	10w	20	2.89	0.25	0.04
		100	12.99	0.77	0.22
	100w	20	27.64	4.02	0.7
		100	127.07	8.44	1.89
csv	100w	20	5.23	0.54	0.04
	1500w	6	32.53	4.17	3.83

4.4, query concurrency test

4.4.1, test scenario description

Analyze the buried data to develop a pressure test business ratio, preview the dashboard: edit the dashboard: edit the self-service data set = 3:1:1, and update the business package with the top 2 update frequency during the day.

	Script scenarios	Percentage of
Preview	Recurring login, recurring preview of the 10 most frequently previewed dashboards	60%
Editor	Recurring login to recursively edit the 10 most frequently edited dashboards	20%
	Recurring login to recursively edit the 9 most frequently edited data sets	20%
Update	Log in only once to cycle through the 2 business packages that are updated frequently during the day	–

[Concurrency] Set total 10, 20, 30, 40, 50 concurrent tests
[Concurrency Duration] Concurrency lasts 20 minutes
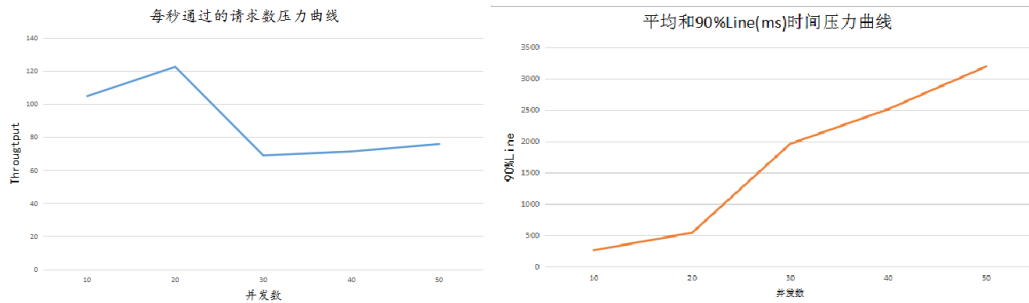[Concurrent start preparation] After each concurrency, execute jcmd < pid> GC.run to manually trigger memory reclaim and wait for memory and cpu to drop down before the next round of testing

4.4.2, test results

Looking at the overall throughput and time pressure curves, jvm is set to 16G and the maximum number of concurrency supported by the system in this scenario is
20.

Request Type	Request Content	90%Line Performance	
		10 Concurrent	20 Concurrent
Non-computational requests	Login, access to data preparation/dashboard etc. pages Face operation	No more than 1s	No more than 1s
	Edit or preview the dashboard except for data Request		
	Edit requests for self-service datasets other than pages		
Calculation request	Preview dashboard data requests	Requests over 3s 0	There is 1 request over 3s
	Edit dashboard data request	Requests over 3s 1	There were 3 requests over 3s
	Edit self-service dataset page request	There were 6 requests that exceeded 3s. More than The total number of requests for 3s is about 13.33%.	There were 10 requests that exceeded 3s. The total number of requests over 3s is about 22.22%

Summary】20 Concurrency, when there is an update in the background, from 90%Line response time

● Non-computational requests: all responded within 1s, with good performance.
● Calculation requests: good performance for the preview dashboard, fair performance for the edit dashboard, and poor performance for the edit dataset.

4.4.3，concurrent conclusions

The concurrency conclusion of version 5.1.5 for setting jvm=16 in a business scenario where both editing and previewing (2:3) are used is

- Support up to 20 concurrency when there is an update in the background
- Excellent performance for non-computational requests
- Slightly inferior performance for editing datasets than the preview/edit dashboard in calculation requests

CPU (E5-32 logical cores) and JVM usage are both within 90% on average.

jvm	Number of concurrent support	90%Line non-calculated request time	90%Line Preview Dashboard Individual Component Calculation Duration	90%Line when editing individual components of a dashboard calculation Long	90%Line Edit self-service dataset single step calculation time
16G	20	<1s	1.2% more than 3s	5.2% more than 3s	17.8% more than 3s

4.5, Platform Performance Test

4.5.1, platform common scene preview hours

Test scenario description.
The test involves function points including: add template, bulk mount, bulk delete, query user, department position, search department, role, access statistics, user behavior, etc. See 3.2.6 Platform common scenarios for details

Order of magnitude description.

Characteristics	Order of magnitude
Catalog Management	Add and delete templates: 30/100/500/1000; FR file directory tree: 1000/1500/2000
User Management	10w (user) _5k (department) _5 (department level) _1k (role)
Permission Management	
Platform Log	Access statistics (50w/100w/1kw), management log (10w/50w/100w), error log (10w/50w/100w)

Test results.

(1), management of basic scenarios

A total of 63 test results, of which **55.56% of scenes** were displayed within 1 second, **25.40% of scen**es 1~3 seconds, and **4.76% of** scenes
3~6 seconds, **4.76%** scenes 6~10s, **9.52%** scenes more than 10s.
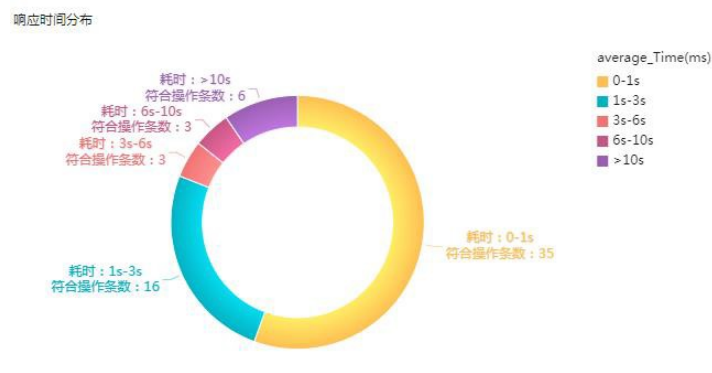
（2），Catalog Management Section FR Template Tree

By testing the performance of FR template tree display at the data level based on 1000/1500/2000 templates at the add template, the response time of the interface increases with the increase of data volume at the same concurrency.

Number of concurrent/nodes	1000	1500	2000
No concurrency	90%line:0.075	90%line:0.164	90%line:0.274

（3）, platform log query

Testing performance at 100,000/500,000/1,000,000/10,000,000 orders of magnitude, respectively

- Access statistics: 500,000 data volume can be displayed in about 6s, 100w data volume can be displayed in about 16s, and 10 million data volume can be guaranteed without downtime.
- Management logs: good query performance up to 1 million data, export performance of management logs will slow down with increasing order of magnitude.
- Error log: The query result belongs to segmented display, so the performance of the query is better, and the query response time will be slowed down somewhat with the increase of the order of magnitude.

Platform log volume	Access Statistics		Management Log		Error Log
	Number of system visits	Server Usage	Inquiry	Export	Inquiry
10w			0.131	0.803	0.368
50w	5.64	5.34	0.247	2.02	0.662
100w	15.67	10.78	0.382	3.45	0.995
1kw	No downtime				

4.5.1.4, weak performance scenarios

Scenes	Remarks
User management-Platform users select all, clear	Based on 10w user testing
Add and delete 500~1000 BI dashboards	Poor performance for adding and deleting large numbers of templates
Add, delete 1000cpt	

50

4.5.2 The results of concurrent scenario testing on the platform

4.5.2.1 , Login

● Normal user login can be responded within 1s for 500 concurrent events, and the response time increases with the number of concurrent events.
Increase.

Concurrent volume	Average	90% Line
40	0.095	0.243
100	0.326	0.468
500	0.639	0.782

4.5.2.2 , view notification messages

● Based on a 100/500 concurrent test with 500/1000 message notification data volume to view the notification message interface, the response time is tabulated below.

Number of concurrent messages / number of messages	500	1000
100	90%line:0.098	90%line:0.223
500	90%line:2.746	90%line:2.651

4.5.2.3 , Platform Directory Tree

● The platform directory tree interface interface is more responsive under different concurrency scenarios, and the response time of the interface increases with increasing concurrency at the same data level. The response time of the interface increases with the increase of data volume under the same concurrency.

Number of concurrent/nodes	1000	1500	2000
No concurrency / 1	90%line:0.030	90%line:0.030	90%line:0.029
500	90%line:2.032	90%line:3.532	90%line:4.765
1000	90%line:4.675	90%line:7.126	90%line:10.296

5、Recommended configuration

When recommending a configuration to a customer, you need to consider both the customer's order of magnitude (5.1) and the number of users dimension (5.2), and choose the higher of the two.

5.1, recommended by order of magnitude configuration

The recommended configurations based on the customer order of magnitude combined with the test findings in Section 4.2 are as follows.

Data volume	Recommended Configuration			
	CPU	JVM Memory	Whole machine memory	Available disk space
0~5 million	8~16 cores, 2.5GHz and above	12G	16~24G	100~300G
5 million~10 million	16~32 cores, 2.5GHz and above	16G	24~32G	300~600G
10 million~100 million	16~32 cores, 2.5GHz and above	32G	48~64G	600~1.5T

5.2 Recommended configuration according to the number of users

5.2.1, Concept

- **Number of registered users**: The number of users in the BI system user table.
- **Number of online users**: The number of users logged in on the BI system at the same time.
- **Concurrent users**: The number of users doing operations on the BI system at the same time, i.e., how many users are sending requests to the server at the same time. That is, how many users are processing requests sent by the server at the same time.
- **Number of concurrent editing users: The** number of users editing the dashboard or dataset at the same moment.
- **lic registration concurrency limit**: Based on the ip address, the server gets the ip address from the request as a concurrency key. mainly limits the cumulative number of ip addresses accessing the system. this parameter of lic is not related to the number of users below.

5.2.2, User Funnel Model

The user funnel model differs greatly depending on the depth of use and usage habits of the BI project. The analysis summarizes the depth of use of BI projects

and defines the percentage of users.

	Number of online users	Number of concurrent users	Number of concurrent editing users
Percentage of **registered** users	2%~10%	0.2%~3.5%	0.002%~0.14%
Percentage of **online** users		10%~35%	0.1% ~ 1.4%
Percentage of business **concurrent** users			1% ~ 4%
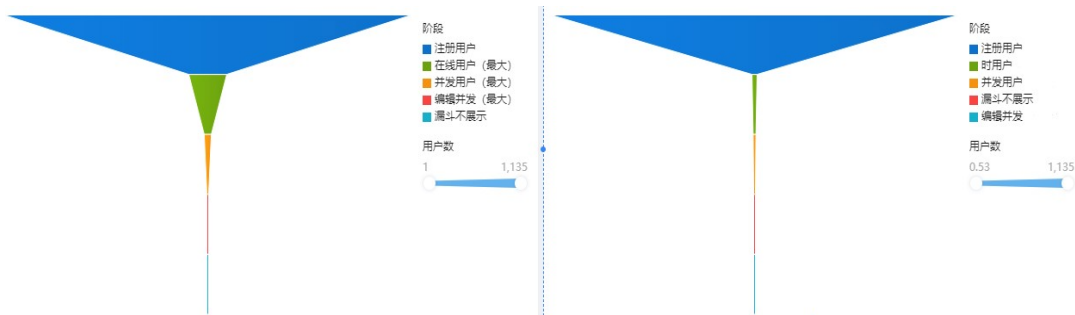
5.2.3 Recommended configuration based on the number of users

Note: JVM memory ≠ whole machine memory, recommended JVM memory is 2/3 ~ 3/4 of whole machine memory

Number of registered users	Number of online users	Number of concurrent users	Number of concurrent users for editing	Recommended Configuration		BI Support
				JVM Memory	CPU	
1k ~ 5k	20 ~ 500	2~150	0 ~ 20	16G	8 Nuclear 2.5GHz and above	Support
5k ~ 1w	500 ~ 1k	20 ~ 350	10 ~ 40	24G	16 Nuclear 2.5GHz and above	Support
5w	1k ~ 5k	100 ~ 500	50 ~ 200	32G	16 Nuclear 2.5GHz and above	Basic Support
10w	2k ~ 1w	200 ~ 1000	100 ~ 400	32G	32 Nuclei 2.5GHz and above	Reluctant support