

Elasticsearch Service

产品简介

产品文档



腾讯云

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产品概述

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Elasticsearch Service (ES) 是基于开源搜索引擎 Elasticsearch 构建的高可用、可伸缩的云端托管 Elasticsearch 服务。Elasticsearch 是一款分布式的基于 RESTful API 的搜索分析引擎，可以应用于日益增多的海量数据搜索和分析等应用场景。

腾讯云 ES 集成了腾讯云计算在计算、存储、安全等领域的领先技术优势，又保持了 Elasticsearch 本身的兼容与开放，拥有丰富的集群管理功能以及安全、弹性、高可用等特性，同时也集成了官方的高级商业特性 (X-Pack)，在开源的基础上，增加了权限管理、SQL、机器学习、告警等功能，可以帮助您简化集群部署、运营管理等基础运维工作，更加聚焦于业务本身。

通过腾讯云 ES，您可以快速构建海量数据存储搜索、实时日志分析等应用，例如网站搜索导航、企业级搜索、服务日志异常监控、点击流分析等。

主要组件

- Elasticsearch

分布式搜索引擎，可以对海量数据进行存储、全文检索、统计分析等，提供了 RESTful API 以及各类语言客户端，可以灵活地按照业务需求进行开发。

- Kibana

数据可视化工具，可以方便地对存入 Elasticsearch 集群的数据进行查询和分析。

- 高级特性 (X-Pack)

Elasticsearch 官方高级商业插件，提供了多项高级功能，包括数据权限管控，可以配置字段级别的权限控制；SQL、JDBC 的连接方式，可以很方便地同原有的业务系统进行集成；机器学习和告警，可以针对存入集群的数据，进行分析和波动趋势的学习，预测数据变化趋势，并在数据出现大的波动时进行告警。

产品功能

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用户可以将 CVM、TencentDB、容器服务等其他云产品的实时日志或业务的存量及增量业务数据，汇聚传输到 ES 集群，进行数据的分布式存储、查询分析。

数据采集与同步

- 用户通过 Elasticsearch 中的 Beats 功能，可以把数据传输到 Elasticsearch 中进行存储，也可以传输到 Logstash 中进行自定义转换和解析后，再传输到 Elasticsearch 中。
- Elasticsearch 提供了易用的 RESTful API，用户可以自行开发客户端，调用数据存储 API，存储数据到 Elasticsearch 集群中。
- ES 构建在 VPC 内，用户可以非常方便地使用各种数据同步插件，将已有云产品的数据，同步到 ES 集群中。

数据存储

- 腾讯云 ES 提供了多种规格的节点类型和高性能 SSD 磁盘，有效保障数据的读写性能。
- 支持弹性扩展到上百个节点，能达到 PB 级数据的存储，满足用户不同类型的业务场景。
- 支持故障节点探测及替换，保障集群高可用性。
- 具备全文检索功能。

数据查询分析可视化

- Elasticsearch 拥有全文检索、结构化搜索、数据过滤和指标统计等搜索功能，可以应用于信息搜索和数据分析等多种场景。
- Elasticsearch 提供了简单易用的 RESTful API 以及各种语言的客户端，用户可以很方便地构建自己的搜索服务。
- 使用 Kibana，用户可以方便地在浏览器里对集群的数据进行搜索和统计分析。

产品性能概述

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本章节介绍通过 Elasticsearch 官方提供的 Benchmark rally 脚本，对不同规格的腾讯云 Elasticsearch Service（ES）实例（7.10.1版本）进行压测的结果。

本章节提供以下几种规格的 ES 集群的压测结果：

- [4核16G 3节点集群性能测试](#)
- [8核32G 3节点集群性能测试](#)

同时提供了4核16G和8核32G的 ES 集群压测的比较结果，详情可参见 [4核16G 3节点与8核32G 3节点集群压测结果比较](#)。

4核16G 3节点集群性能测试

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本文提供4核16G SSD 200G 3个节点的腾讯云 Elasticsearch Service 集群的性能指标。

说明：

数据为官方提供的 [geonames](#)，包含11396503条地理位置信息，总大小接近3GB，包含了 text、long、geo 等类型数据，覆盖行列存。

对比4核16GB SSD 200G 3节点的腾讯云 ES 和社区版本的集群性能指标，腾讯云 ES 各方面性能均有一定优势。主要得益于腾讯云 ES 在底层存储模型优化（时序合并、冷分片持续合并）、查询执行计划优化（高效剪枝、缓存优化）、内置场景模板、自研 JDK、GC 参数调优等方面的优化，详见 [内核增强](#)。

geonames/7.10.1/4核16GB

说明	Metric	Unit	Task	腾讯云ES	社区版ES
写入总耗时	Cumulative indexing time of primary shards	min	-	16.3633	17.81
GC 总次数、耗时统计	Total Young Gen GC time	s	-	6.26	68.45
	Total Young Gen GC count	次	-	892	4163
	Total Old Gen GC time	s	-	0	0

说明	Metric	Unit	Task	腾讯云ES	社区版
	Total Old Gen GC count	次	-	0	0
存储大小	Store size	GB	-	2.51866	2.938
堆内存使用量	Heap used for segments	MB	-	0.803783	0.709
	Heap used for doc values	MB	-	0.0284767	0.021
	Heap used for terms	MB	-	0.655075	0.562
	Heap used for norms	MB	-	0.0732422	0.076
	Heap used for points	MB	-	0	0
	Heap used for stored fields	MB	-	0.0469894	0.047
segment 总数量	Segment count	次	-	6	97
写入吞吐、耗时统计	Min Throughput	docs/s	index-append	89331.9	8060
	Median Throughput	docs/s	index-append	90268.8	8257
	Max Throughput	docs/s	index-append	90516.1	8403
	50th percentile latency	ms	index-append	233.258	305.7

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile latency	ms	index-append	314.558	354.1
	99th percentile latency	ms	index-append	341.303	403.7
	100th percentile latency	ms	index-append	354.657	428.3
	50th percentile service time	ms	index-append	233.258	305.7
	90th percentile service time	ms	index-append	314.558	354.1
	99th percentile service time	ms	index-append	341.303	403.7
	100th percentile service time	ms	index-append	354.657	428.3
	error rate	%	index-append	0	0
index 指标统计	Min Throughput	ops/s	index-stats	90.04	90.05
	Median Throughput	ops/s	index-stats	90.07	90.07
	Max Throughput	ops/s	index-stats	90.14	90.13

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile latency	ms	index-stats	2.91003	3.078
	90th percentile latency	ms	index-stats	3.82882	4.276
	99th percentile latency	ms	index-stats	4.2378	4.753
	99.9th percentile latency	ms	index-stats	4.34459	9.233
	100th percentile latency	ms	index-stats	8.22393	17.36
	50th percentile service time	ms	index-stats	1.78268	2.178
	90th percentile service time	ms	index-stats	2.07484	2.550
	99th percentile service time	ms	index-stats	2.43121	2.940
	99.9th percentile service time	ms	index-stats	3.09198	3.503

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile service time	ms	index-stats	7.29974	15.57
	error rate	%	index-stats	0	0
node 指标统计	Min Throughput	ops/s	node-stats	90.06	90.05
	Median Throughput	ops/s	node-stats	90.09	90.09
	Max Throughput	ops/s	node-stats	90.34	90.33
	50th percentile latency	ms	node-stats	3.17223	3.604
	90th percentile latency	ms	node-stats	3.70681	4.171
	99th percentile latency	ms	node-stats	5.01334	5.771
	99.9th percentile latency	ms	node-stats	6.75018	7.298
	100th percentile latency	ms	node-stats	7.98905	8.643
	50th percentile service time	ms	node-stats	2.43876	2.802

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile service time	ms	node-stats	2.78272	3.253
	99th percentile service time	ms	node-stats	4.12234	5.213
	99.9th percentile service time	ms	node-stats	6.35902	6.696
	100th percentile service time	ms	node-stats	7.4313	7.524
	error rate	%	node-stats	0	0
默认查询，所有文档 score 为1 (match_all)	Min Throughput	ops/s	default	50.03	50.03
	Median Throughput	ops/s	default	50.04	50.04
	Max Throughput	ops/s	default	50.08	50.07
	50th percentile latency	ms	default	3.89929	4.978
	90th percentile latency	ms	default	4.39236	5.478
	99th percentile latency	ms	default	4.78834	6.312

说明	Metric	Unit	Task	腾讯云ES	社区版
	99.9th percentile latency	ms	default	7.10486	46.10
	100th percentile latency	ms	default	8.75822	59.30
	50th percentile service time	ms	default	3.18269	4.131
	90th percentile service time	ms	default	3.49347	4.477
	99th percentile service time	ms	default	3.8746	5.305
	99.9th percentile service time	ms	default	6.68581	9.826
	100th percentile service time	ms	default	8.30396	58.16
	error rate	%	default	0	0
term 条件查询	Min Throughput	ops/s	term	100.05	100.0
	Median Throughput	ops/s	term	100.07	100.0
	Max Throughput	ops/s	term	100.14	100.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile latency	ms	term	3.17419	3.370
	90th percentile latency	ms	term	3.62229	3.870
	99th percentile latency	ms	term	4.03812	5.638
	99.9th percentile latency	ms	term	5.9753	7.940
	100th percentile latency	ms	term	8.03321	11.08
	50th percentile service time	ms	term	2.49755	2.592
	90th percentile service time	ms	term	2.71322	2.929
	99th percentile service time	ms	term	3.20673	4.403
	99.9th percentile service time	ms	term	5.17998	7.026

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile service time	ms	term	6.95227	10.76
	error rate	%	term	0	0
词组查询（query）	Min Throughput	ops/s	phrase	110.05	110.0
	Median Throughput	ops/s	phrase	110.07	110.0
	Max Throughput	ops/s	phrase	110.12	110.1
	50th percentile latency	ms	phrase	3.09905	3.190
	90th percentile latency	ms	phrase	3.62549	3.741
	99th percentile latency	ms	phrase	4.55457	7.785
	99.9th percentile latency	ms	phrase	8.29519	20.24
	100th percentile latency	ms	phrase	9.39771	23.24
	50th percentile service time	ms	phrase	2.38248	2.385

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile service time	ms	phrase	2.77084	2.751
	99th percentile service time	ms	phrase	3.75448	5.271
	99.9th percentile service time	ms	phrase	7.5974	19.28
	100th percentile service time	ms	phrase	8.98362	22.71
	error rate	%	phrase	0	0
不带缓存的聚合查询 (aggregation)	Min Throughput	ops/s	country_agg_uncached	3.6	3.6
	Median Throughput	ops/s	country_agg_uncached	3.61	3.6
	Max Throughput	ops/s	country_agg_uncached	3.61	3.61
	50th percentile latency	ms	country_agg_uncached	157.466	179.8
	90th percentile latency	ms	country_agg_uncached	217.148	285.8
	99th percentile latency	ms	country_agg_uncached	233.185	294.4

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile latency	ms	country_agg_uncached	233.227	297.4
	50th percentile service time	ms	country_agg_uncached	156.197	174.5
	90th percentile service time	ms	country_agg_uncached	215.852	285.2
	99th percentile service time	ms	country_agg_uncached	232.177	287.2
	100th percentile service time	ms	country_agg_uncached	232.321	287.5
	error rate	%	country_agg_uncached	0	0
带缓存的聚合查询 (aggregation)	Min Throughput	ops/s	country_agg_cached	100.03	100.0
	Median Throughput	ops/s	country_agg_cached	100.05	100.0
	Max Throughput	ops/s	country_agg_cached	100.08	100.0
	50th percentile latency	ms	country_agg_cached	2.44457	2.434
	90th percentile latency	ms	country_agg_cached	2.97922	2.939

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile latency	ms	country_agg_cached	3.96393	3.891
	99.9th percentile latency	ms	country_agg_cached	5.3294	5.351
	100th percentile latency	ms	country_agg_cached	7.9529	5.424
	50th percentile service time	ms	country_agg_cached	1.71924	1.665
	90th percentile service time	ms	country_agg_cached	1.97892	1.848
	99th percentile service time	ms	country_agg_cached	2.22611	2.170
	99.9th percentile service time	ms	country_agg_cached	5.0967	4.255
	100th percentile service time	ms	country_agg_cached	7.02246	4.951
	error rate	%	country_agg_cached	0	0
分页拉取	Min Throughput	pages/s	scroll	20.04	20.05

说明	Metric	Unit	Task	腾讯云ES	社区版
	Median Throughput	pages/s	scroll	20.04	20.06
	Max Throughput	pages/s	scroll	20.05	20.07
	50th percentile latency	ms	scroll	576.675	598.1
	90th percentile latency	ms	scroll	585.156	620.3
	99th percentile latency	ms	scroll	598.95	646.0
	100th percentile latency	ms	scroll	602.009	646.5
	50th percentile service time	ms	scroll	575.118	596.7
	90th percentile service time	ms	scroll	583.906	618.8
	99th percentile service time	ms	scroll	597.482	644.6
	100th percentile service time	ms	scroll	600.578	644.8
	error rate	%	scroll	0	0

说明	Metric	Unit	Task	腾讯云ES	社区版
脚本查询（使用 expression 脚本）	Min Throughput	ops/s	expression	2	2
	Median Throughput	ops/s	expression	2	2
	Max Throughput	ops/s	expression	2	2
	50th percentile latency	ms	expression	299.685	360.0
	90th percentile latency	ms	expression	416.613	491.7
	99th percentile latency	ms	expression	465.776	500.1
	100th percentile latency	ms	expression	468.083	500.2
	50th percentile service time	ms	expression	298.594	359.0
	90th percentile service time	ms	expression	415.045	489.9
	99th percentile service time	ms	expression	464.598	499.0

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile service time	ms	expression	467.106	499.0
	error rate	%	expression	0	0
脚本查询（使用painless 静态脚本，不动态取字段值）	Min Throughput	ops/s	painless_static	1.5	1.5
	Median Throughput	ops/s	painless_static	1.5	1.5
	Max Throughput	ops/s	painless_static	1.5	1.5
	50th percentile latency	ms	painless_static	383.485	389.3
	90th percentile latency	ms	painless_static	514.495	641.9
	99th percentile latency	ms	painless_static	561.342	644.1
	100th percentile latency	ms	painless_static	568.066	646.0
	50th percentile service time	ms	painless_static	382.158	388.1
	90th percentile service time	ms	painless_static	513.202	640.3

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile service time	ms	painless_static	560.61	642.8
	100th percentile service time	ms	painless_static	567.419	644.8
	error rate	%	painless_static	0	0
脚本查询（使用 <code>painless</code> 静态脚本，动态获取字段值）	Min Throughput	ops/s	painless_dynamic	1.5	1.5
	Median Throughput	ops/s	painless_dynamic	1.5	1.5
	Max Throughput	ops/s	painless_dynamic	1.5	1.5
	50th percentile latency	ms	painless_dynamic	377.278	393.0
	90th percentile latency	ms	painless_dynamic	517.496	633.8
	99th percentile latency	ms	painless_dynamic	576.697	653.9
	100th percentile latency	ms	painless_dynamic	580.017	660.3
	50th percentile service time	ms	painless_dynamic	376.339	391.5

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile service time	ms	painless_dynamic	516.407	632.7
	99th percentile service time	ms	painless_dynamic	575.714	652.8
	100th percentile service time	ms	painless_dynamic	579.642	659.1
	error rate	%	painless_dynamic	0	0
地理范围查询（基于高斯衰减函数）	Min Throughput	ops/s	decay_geo_gauss_function_score	1	1
	Median Throughput	ops/s	decay_geo_gauss_function_score	1	1
	Max Throughput	ops/s	decay_geo_gauss_function_score	1	1
	50th percentile latency	ms	decay_geo_gauss_function_score	348.531	388.6
	90th percentile latency	ms	decay_geo_gauss_function_score	398.351	472.0
	99th percentile latency	ms	decay_geo_gauss_function_score	411.483	492.9
	100th percentile latency	ms	decay_geo_gauss_function_score	457.615	494.5

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile service time	ms	decay_geo_gauss_function_score	346.881	386.7
	90th percentile service time	ms	decay_geo_gauss_function_score	397.08	470.9
	99th percentile service time	ms	decay_geo_gauss_function_score	410.421	490.4
	100th percentile service time	ms	decay_geo_gauss_function_score	455.704	492.5
	error rate	%	decay_geo_gauss_function_score	0	0
地理范围查询（基于高斯衰减函数，且脚本动态获取字段值）	Min Throughput	ops/s	decay_geo_gauss_script_score	1	1
	Median Throughput	ops/s	decay_geo_gauss_script_score	1	1
	Max Throughput	ops/s	decay_geo_gauss_script_score	1	1
	50th percentile latency	ms	decay_geo_gauss_script_score	368.275	430.7
	90th percentile latency	ms	decay_geo_gauss_script_score	414.905	539.7
	99th percentile latency	ms	decay_geo_gauss_script_score	468.888	543.6

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile latency	ms	decay_geo_gauss_script_score	477.25	546.9
	50th percentile service time	ms	decay_geo_gauss_script_score	366.945	429.5
	90th percentile service time	ms	decay_geo_gauss_script_score	413.609	538.2
	99th percentile service time	ms	decay_geo_gauss_script_score	467.627	542.6
	100th percentile service time	ms	decay_geo_gauss_script_score	475.367	545.4
	error rate	%	decay_geo_gauss_script_score	0	0
自定义评分函数查询 (基于字段值定义函数)	Min Throughput	ops/s	field_value_function_score	1.5	1.5
	Median Throughput	ops/s	field_value_function_score	1.5	1.5
	Max Throughput	ops/s	field_value_function_score	1.51	1.51
	50th percentile latency	ms	field_value_function_score	139.661	162.1
	90th percentile latency	ms	field_value_function_score	183.675	215.8

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile latency	ms	field_value_function_score	197.653	221.5
	100th percentile latency	ms	field_value_function_score	202.345	228.1
	50th percentile service time	ms	field_value_function_score	138.423	159.9
	90th percentile service time	ms	field_value_function_score	182.404	214.4
	99th percentile service time	ms	field_value_function_score	196.734	220.5
	100th percentile service time	ms	field_value_function_score	201.442	226.3
	error rate	%	field_value_function_score	0	0
自定义评分函数查询 (通过脚本动态获取 字段值计算评分)	Min Throughput	ops/s	field_value_script_score	1.5	1.5
	Median Throughput	ops/s	field_value_script_score	1.5	1.5
	Max Throughput	ops/s	field_value_script_score	1.51	1.51
	50th percentile latency	ms	field_value_script_score	188.952	189.7

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile latency	ms	field_value_script_score	264.095	313.2
	99th percentile latency	ms	field_value_script_score	271.153	326.8
	100th percentile latency	ms	field_value_script_score	271.901	338.1
	50th percentile service time	ms	field_value_script_score	187.218	187.5
	90th percentile service time	ms	field_value_script_score	263.207	311.5
	99th percentile service time	ms	field_value_script_score	269.578	325.7
	100th percentile service time	ms	field_value_script_score	270.138	336.6
	error rate	%	field_value_script_score	0	0
大量 terms 条件查询 (query)	Min Throughput	ops/s	large_terms	1.1	1.1
	Median Throughput	ops/s	large_terms	1.1	1.1
	Max Throughput	ops/s	large_terms	1.1	1.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile latency	ms	large_terms	265.007	835.4
	90th percentile latency	ms	large_terms	296.009	1134
	99th percentile latency	ms	large_terms	310.358	1323
	100th percentile latency	ms	large_terms	311.049	1360
	50th percentile service time	ms	large_terms	256.372	774.7
	90th percentile service time	ms	large_terms	287.851	1022
	99th percentile service time	ms	large_terms	301.827	1033
	100th percentile service time	ms	large_terms	302.251	1033
	error rate	%	large_terms	0	0
大量 terms 条件过滤查询（query、filter）	Min Throughput	ops/s	large_filtered_terms	1.1	1.1
	Median Throughput	ops/s	large_filtered_terms	1.1	1.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	Max Throughput	ops/s	large_filtered_terms	1.1	1.1
	50th percentile latency	ms	large_filtered_terms	268.135	778.7
	90th percentile latency	ms	large_filtered_terms	304.158	1007
	99th percentile latency	ms	large_filtered_terms	351.209	1107
	100th percentile latency	ms	large_filtered_terms	352.003	1137
	50th percentile service time	ms	large_filtered_terms	259.546	695.2
	90th percentile service time	ms	large_filtered_terms	295.721	997.7
	99th percentile service time	ms	large_filtered_terms	342.342	1023
	100th percentile service time	ms	large_filtered_terms	343.378	1026
	error rate	%	large_filtered_terms	0	0
大量条件取反查询 (query、must not)	Min Throughput	ops/s	large_prohibited_terms	1.1	1.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	Median Throughput	ops/s	large_prohibited_terms	1.1	1.1
	Max Throughput	ops/s	large_prohibited_terms	1.1	1.1
	50th percentile latency	ms	large_prohibited_terms	270.041	828.1
	90th percentile latency	ms	large_prohibited_terms	310.351	1120
	99th percentile latency	ms	large_prohibited_terms	347.414	1294
	100th percentile latency	ms	large_prohibited_terms	349.499	1371
	50th percentile service time	ms	large_prohibited_terms	261.734	728.8
	90th percentile service time	ms	large_prohibited_terms	302.279	1012
	99th percentile service time	ms	large_prohibited_terms	339.278	1032
	100th percentile service time	ms	large_prohibited_terms	340.817	1034
	error rate	%	large_prohibited_terms	0	0

说明	Metric	Unit	Task	腾讯云ES	社区版
降序排序查询	Min Throughput	ops/s	desc_sort_population	1.5	1.5
	Median Throughput	ops/s	desc_sort_population	1.51	1.51
	Max Throughput	ops/s	desc_sort_population	1.51	1.51
	50th percentile latency	ms	desc_sort_population	58.5828	65.92
	90th percentile latency	ms	desc_sort_population	77.9981	118.9
	99th percentile latency	ms	desc_sort_population	80.8863	119.3
	100th percentile latency	ms	desc_sort_population	83.1661	119.4
	50th percentile service time	ms	desc_sort_population	57.1212	64.26
	90th percentile service time	ms	desc_sort_population	76.7082	117.4
	99th percentile service time	ms	desc_sort_population	79.2907	117.7

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile service time	ms	desc_sort_population	81.6364	117.8
	error rate	%	desc_sort_population	0	0
升序排序查询	Min Throughput	ops/s	asc_sort_population	1.5	1.5
	Median Throughput	ops/s	asc_sort_population	1.51	1.51
	Max Throughput	ops/s	asc_sort_population	1.51	1.51
	50th percentile latency	ms	asc_sort_population	62.4328	86.14
	90th percentile latency	ms	asc_sort_population	79.8441	123.8
	99th percentile latency	ms	asc_sort_population	83.9411	124.5
	100th percentile latency	ms	asc_sort_population	84.3925	125.3
	50th percentile service time	ms	asc_sort_population	61.0637	84.97
	90th percentile service time	ms	asc_sort_population	78.4101	122.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile service time	ms	asc_sort_population	82.2652	123.4
	100th percentile service time	ms	asc_sort_population	82.5616	124.0
	error rate	%	asc_sort_population	0	0
升序排序后 after 跳转查询	Min Throughput	ops/s	asc_sort_with_after_population	1.5	1.5
	Median Throughput	ops/s	asc_sort_with_after_population	1.51	1.5
	Max Throughput	ops/s	asc_sort_with_after_population	1.51	1.51
	50th percentile latency	ms	asc_sort_with_after_population	88.1871	99.93
	90th percentile latency	ms	asc_sort_with_after_population	127.995	173.2
	99th percentile latency	ms	asc_sort_with_after_population	131.171	174.5
	100th percentile latency	ms	asc_sort_with_after_population	132.181	174.6
	50th percentile service time	ms	asc_sort_with_after_population	87.132	98.22

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile service time	ms	asc_sort_with_after_population	126.818	171.2
	99th percentile service time	ms	asc_sort_with_after_population	129.453	171.6
	100th percentile service time	ms	asc_sort_with_after_population	130.452	171.6
	error rate	%	asc_sort_with_after_population	0	0
高基字段降序排序查询（基于 DistanceFeatureQuery 快速取 topK）	Min Throughput	ops/s	desc_sort_geonameid	6.02	6.02
	Median Throughput	ops/s	desc_sort_geonameid	6.02	6.02
	Max Throughput	ops/s	desc_sort_geonameid	6.03	6.03
	50th percentile latency	ms	desc_sort_geonameid	7.4659	7.551
	90th percentile latency	ms	desc_sort_geonameid	8.26766	9.075
	99th percentile latency	ms	desc_sort_geonameid	8.72369	9.695
	100th percentile latency	ms	desc_sort_geonameid	8.79956	10.46

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile service time	ms	desc_sort_geonameid	6.59986	6.523
	90th percentile service time	ms	desc_sort_geonameid	7.24539	7.858
	99th percentile service time	ms	desc_sort_geonameid	7.57925	8.405
	100th percentile service time	ms	desc_sort_geonameid	7.64471	9.405
	error rate	%	desc_sort_geonameid	0	0
高基字段降序排序 after 跳转查询	Min Throughput	ops/s	desc_sort_with_after_geonameid	6.01	6
	Median Throughput	ops/s	desc_sort_with_after_geonameid	6.01	6.01
	Max Throughput	ops/s	desc_sort_with_after_geonameid	6.02	6.01
	50th percentile latency	ms	desc_sort_with_after_geonameid	89.4587	107.9
	90th percentile latency	ms	desc_sort_with_after_geonameid	119.777	154.5
	99th percentile latency	ms	desc_sort_with_after_geonameid	123.271	155.6

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile latency	ms	desc_sort_with_after_geonameid	123.628	156.3
	50th percentile service time	ms	desc_sort_with_after_geonameid	88.512	107.0
	90th percentile service time	ms	desc_sort_with_after_geonameid	118.72	153.3
	99th percentile service time	ms	desc_sort_with_after_geonameid	122.79	153.8
	100th percentile service time	ms	desc_sort_with_after_geonameid	122.791	154.5
	error rate	%	desc_sort_with_after_geonameid	0	0
高基字段升序排序查询（基于 DistanceFeatureQuery 快速取 topK）	Min Throughput	ops/s	asc_sort_geonameid	6.02	6.02
	Median Throughput	ops/s	asc_sort_geonameid	6.02	6.02
	Max Throughput	ops/s	asc_sort_geonameid	6.03	6.03
	50th percentile latency	ms	asc_sort_geonameid	5.80593	5.781
	90th percentile latency	ms	asc_sort_geonameid	6.55438	6.605

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile latency	ms	asc_sort_geonameid	7.36432	8.357
	100th percentile latency	ms	asc_sort_geonameid	7.49672	30.89
	50th percentile service time	ms	asc_sort_geonameid	4.91916	4.954
	90th percentile service time	ms	asc_sort_geonameid	5.61126	5.265
	99th percentile service time	ms	asc_sort_geonameid	6.12285	7.428
	100th percentile service time	ms	asc_sort_geonameid	6.51222	29.84
	error rate	%	asc_sort_geonameid	0	0
高基字段升序排序 after 跳转查询	Min Throughput	ops/s	asc_sort_with_after_geonameid	6.01	6
	Median Throughput	ops/s	asc_sort_with_after_geonameid	6.01	6.01
	Max Throughput	ops/s	asc_sort_with_after_geonameid	6.01	6.02
	50th percentile latency	ms	asc_sort_with_after_geonameid	70.994	102.9

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile latency	ms	asc_sort_with_after_geonameid	104.817	137.4
	99th percentile latency	ms	asc_sort_with_after_geonameid	108.797	139.0
	100th percentile latency	ms	asc_sort_with_after_geonameid	108.929	140.1
	50th percentile service time	ms	asc_sort_with_after_geonameid	69.7056	101.6
	90th percentile service time	ms	asc_sort_with_after_geonameid	103.875	136.3
	99th percentile service time	ms	asc_sort_with_after_geonameid	107.828	138.3
	100th percentile service time	ms	asc_sort_with_after_geonameid	108.539	139.0
	error rate	%	asc_sort_with_after_geonameid	0	0

8核32G 3节点集群性能测试

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本文提供8核32G SSD 200G 3个节点的腾讯云 Elasticsearch Service 集群的性能指标。

说明：

数据为官方提供的 [geonames](#)，包含11396503条地理位置信息，总大小接近3GB，包含了 text、long、geo 等类型数据，覆盖行列存。

对比8核32GB SSD 200G 3节点的腾讯云 ES 和社区版本的集群性能指标，腾讯云 ES 各方面性能均有一定优势。主要得益于腾讯云 ES 在底层存储模型优化（时序合并、冷分片持续合并）、查询执行计划优化（高效剪枝、缓存优化）、内置场景模板、自研 JDK、GC 参数调优等方面的优化，详见 [内核增强](#)。

geonames/7.10.1/8核32GB

说明	Metric	Unit	Task	腾讯云ES	社区版ES
写入总耗时	Cumulative indexing time of primary shards	min	-	14.2567	15.48
GC 总次数、耗时统计	Total Young Gen GC time	s	-	3.544	17.73
	Total Young Gen GC count	次	-	447	1084
	Total Old Gen GC time	s	-	0	0

说明	Metric	Unit	Task	腾讯云ES	社区版
	Total Old Gen GC count	次	-	0	0
存储大小	Store size	GB	-	2.59725	3.076
堆内存使用量	Heap used for segments	MB	-	0.534325	0.766
	Heap used for doc values	MB	-	0.0507355	0.031
	Heap used for terms	MB	-	0.370026	0.601
	Heap used for norms	MB	-	0.0396729	0.081
	Heap used for points	MB	-	0	0
	Heap used for stored fields	MB	-	0.0119553	0.051
segment 总数量	Segment count	次	-	7	105
写入吞吐、耗时统计	Min Throughput	docs/s	index-append	153730	1327
	Median Throughput	docs/s	index-append	159765	1428
	Max Throughput	docs/s	index-append	162791	1486
	50th percentile latency	ms	index-append	130.877	151.6

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile latency	ms	index-append	162.969	187.7
	99th percentile latency	ms	index-append	181.428	240.1
	100th percentile latency	ms	index-append	225.98	285.1
	50th percentile service time	ms	index-append	130.877	151.6
	90th percentile service time	ms	index-append	162.969	187.7
	99th percentile service time	ms	index-append	181.428	240.1
	100th percentile service time	ms	index-append	225.98	285.1
	error rate	%	index-append	0	0
index 指标统计	Min Throughput	ops/s	index-stats	90.05	90.05
	Median Throughput	ops/s	index-stats	90.06	90.07
	Max Throughput	ops/s	index-stats	90.12	90.13

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile latency	ms	index-stats	2.76736	2.658
	90th percentile latency	ms	index-stats	3.58235	3.489
	99th percentile latency	ms	index-stats	3.95798	3.893
	99.9th percentile latency	ms	index-stats	4.39377	9.076
	100th percentile latency	ms	index-stats	9.00375	18.12
	50th percentile service time	ms	index-stats	1.57744	1.452
	90th percentile service time	ms	index-stats	1.8317	1.661
	99th percentile service time	ms	index-stats	2.0752	1.946
	99.9th percentile service time	ms	index-stats	2.24891	2.647

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile service time	ms	index-stats	2.31078	16.50
	error rate	%	index-stats	0	0
node 指标统计	Min Throughput	ops/s	node-stats	90.06	90.06
	Median Throughput	ops/s	node-stats	90.12	90.12
	Max Throughput	ops/s	node-stats	90.36	90.36
	50th percentile latency	ms	node-stats	2.9754	2.938
	90th percentile latency	ms	node-stats	4.07929	4.028
	99th percentile latency	ms	node-stats	5.0754	4.789
	99.9th percentile latency	ms	node-stats	6.53613	17.07
	100th percentile latency	ms	node-stats	6.93454	24.78
	50th percentile service time	ms	node-stats	2.23841	2.177

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile service time	ms	node-stats	2.65367	2.624
	99th percentile service time	ms	node-stats	3.92073	3.930
	99.9th percentile service time	ms	node-stats	4.92842	4.481
	100th percentile service time	ms	node-stats	5.92757	23.78
	error rate	%	node-stats	0	0
默认查询，所有文档 score 为1 (match_all)	Min Throughput	ops/s	default	50.03	50.03
	Median Throughput	ops/s	default	50.04	50.04
	Max Throughput	ops/s	default	50.08	50.08
	50th percentile latency	ms	default	3.53894	3.402
	90th percentile latency	ms	default	4.11403	4.572
	99th percentile latency	ms	default	4.92737	5.374

说明	Metric	Unit	Task	腾讯云ES	社区版
	99.9th percentile latency	ms	default	5.74037	25.89
	100th percentile latency	ms	default	7.32557	27.20
	50th percentile service time	ms	default	2.7831	2.674
	90th percentile service time	ms	default	3.17322	2.979
	99th percentile service time	ms	default	3.77477	3.387
	99.9th percentile service time	ms	default	4.19186	25.17
	100th percentile service time	ms	default	6.58243	26.16
	error rate	%	default	0	0
term 条件查询	Min Throughput	ops/s	term	99.66	100.0
	Median Throughput	ops/s	term	100.07	100.0
	Max Throughput	ops/s	term	100.11	100.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile latency	ms	term	2.83987	2.729
	90th percentile latency	ms	term	3.32569	3.168
	99th percentile latency	ms	term	3.96055	3.667
	99.9th percentile latency	ms	term	4.33961	9.622
	100th percentile latency	ms	term	5.70421	16.45
	50th percentile service time	ms	term	2.08935	2.002
	90th percentile service time	ms	term	2.53284	2.243
	99th percentile service time	ms	term	2.99484	2.641
	99.9th percentile service time	ms	term	3.37709	6.104

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile service time	ms	term	5.24029	15.80
	error rate	%	term	0	0
词组查询（query）	Min Throughput	ops/s	phrase	110.04	110.0
	Median Throughput	ops/s	phrase	110.08	110.0
	Max Throughput	ops/s	phrase	110.11	110.1
	50th percentile latency	ms	phrase	2.74088	2.891
	90th percentile latency	ms	phrase	3.30207	3.393
	99th percentile latency	ms	phrase	4.8127	8.223
	99.9th percentile latency	ms	phrase	5.57204	25.99
	100th percentile latency	ms	phrase	6.54587	27.91
	50th percentile service time	ms	phrase	1.98839	2.189

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile service time	ms	phrase	2.41365	2.511
	99th percentile service time	ms	phrase	4.00121	3.242
	99.9th percentile service time	ms	phrase	4.70793	25.72
	100th percentile service time	ms	phrase	5.67829	27.48
	error rate	%	phrase	0	0
不带缓存的聚合查询 (aggregation)	Min Throughput	ops/s	country_agg_uncached	3.6	3.6
	Median Throughput	ops/s	country_agg_uncached	3.61	3.61
	Max Throughput	ops/s	country_agg_uncached	3.61	3.61
	50th percentile latency	ms	country_agg_uncached	130.314	162.6
	90th percentile latency	ms	country_agg_uncached	147.567	176.4
	99th percentile latency	ms	country_agg_uncached	165.174	184.3

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile latency	ms	country_agg_uncached	174.015	269.5
	50th percentile service time	ms	country_agg_uncached	129.186	161.7
	90th percentile service time	ms	country_agg_uncached	146.921	175.8
	99th percentile service time	ms	country_agg_uncached	164.579	183.7
	100th percentile service time	ms	country_agg_uncached	172.827	269.5
	error rate	%	country_agg_uncached	0	0
带缓存的聚合查询 (aggregation)	Min Throughput	ops/s	country_agg_cached	100.04	100.0
	Median Throughput	ops/s	country_agg_cached	100.05	100.0
	Max Throughput	ops/s	country_agg_cached	100.08	100.0
	50th percentile latency	ms	country_agg_cached	2.29531	2.102
	90th percentile latency	ms	country_agg_cached	3.57418	3.492

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile latency	ms	country_agg_cached	3.91685	3.747
	99.9th percentile latency	ms	country_agg_cached	4.19749	4.057
	100th percentile latency	ms	country_agg_cached	4.51842	4.630
	50th percentile service time	ms	country_agg_cached	1.57861	1.406
	90th percentile service time	ms	country_agg_cached	1.89111	1.588
	99th percentile service time	ms	country_agg_cached	2.19488	1.745
	99.9th percentile service time	ms	country_agg_cached	3.42563	3.465
	100th percentile service time	ms	country_agg_cached	4.28971	3.976
	error rate	%	country_agg_cached	0	0
分页拉取	Min Throughput	pages/s	scroll	20.04	20.04

说明	Metric	Unit	Task	腾讯云ES	社区版
	Median Throughput	pages/s	scroll	20.05	20.04
	Max Throughput	pages/s	scroll	20.06	20.06
	50th percentile latency	ms	scroll	538.421	556.1
	90th percentile latency	ms	scroll	543.566	573.9
	99th percentile latency	ms	scroll	582.263	585.6
	100th percentile latency	ms	scroll	584.75	587.0
	50th percentile service time	ms	scroll	537.068	554.3
	90th percentile service time	ms	scroll	542.428	572.3
	99th percentile service time	ms	scroll	580.372	583.7
	100th percentile service time	ms	scroll	583.612	584.7
	error rate	%	scroll	0	0

说明	Metric	Unit	Task	腾讯云ES	社区版
脚本查询（使用 expression 脚本）	Min Throughput	ops/s	expression	2	2
	Median Throughput	ops/s	expression	2	2
	Max Throughput	ops/s	expression	2	2
	50th percentile latency	ms	expression	265.631	277.4
	90th percentile latency	ms	expression	287.121	299.5
	99th percentile latency	ms	expression	311.788	434.4
	100th percentile latency	ms	expression	391.745	446.2
	50th percentile service time	ms	expression	264.462	276.5
	90th percentile service time	ms	expression	285.113	298.4
	99th percentile service time	ms	expression	310.991	434.0

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile service time	ms	expression	390.33	445.6
	error rate	%	expression	0	0
脚本查询（使用 painless 静态脚本，不动态取字段值）	Min Throughput	ops/s	painless_static	1.5	1.5
	Median Throughput	ops/s	painless_static	1.5	1.5
	Max Throughput	ops/s	painless_static	1.5	1.5
	50th percentile latency	ms	painless_static	337.96	364.6
	90th percentile latency	ms	painless_static	358.738	383.5
	99th percentile latency	ms	painless_static	375.017	459.5
	100th percentile latency	ms	painless_static	395.417	557.7
	50th percentile service time	ms	painless_static	337.111	363.4
	90th percentile service time	ms	painless_static	357.771	382.4

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile service time	ms	painless_static	374.121	458.5
	100th percentile service time	ms	painless_static	394.632	556.4
	error rate	%	painless_static	0	0
脚本查询（使用 <code>painless</code> 静态脚本，动态获取字段值）	Min Throughput	ops/s	painless_dynamic	1.5	1.5
	Median Throughput	ops/s	painless_dynamic	1.5	1.5
	Max Throughput	ops/s	painless_dynamic	1.5	1.5
	50th percentile latency	ms	painless_dynamic	334.684	365.5
	90th percentile latency	ms	painless_dynamic	354.406	390.4
	99th percentile latency	ms	painless_dynamic	377.214	552.4
	100th percentile latency	ms	painless_dynamic	381.276	554.1
	50th percentile service time	ms	painless_dynamic	333.654	364.5

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile service time	ms	painless_dynamic	353.246	389.4
	99th percentile service time	ms	painless_dynamic	375.956	551.6
	100th percentile service time	ms	painless_dynamic	379.75	553.2
	error rate	%	painless_dynamic	0	0
地理范围查询（基于高斯衰减函数）	Min Throughput	ops/s	decay_geo_gauss_function_score	1	1
	Median Throughput	ops/s	decay_geo_gauss_function_score	1	1
	Max Throughput	ops/s	decay_geo_gauss_function_score	1	1
	50th percentile latency	ms	decay_geo_gauss_function_score	327.972	327.6
	90th percentile latency	ms	decay_geo_gauss_function_score	336.979	344.3
	99th percentile latency	ms	decay_geo_gauss_function_score	343.562	417.3
	100th percentile latency	ms	decay_geo_gauss_function_score	344.135	420.9

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile service time	ms	decay_geo_gauss_function_score	326.554	326.5
	90th percentile service time	ms	decay_geo_gauss_function_score	336.053	343.3
	99th percentile service time	ms	decay_geo_gauss_function_score	342.151	416.7
	100th percentile service time	ms	decay_geo_gauss_function_score	342.843	419.4
	error rate	%	decay_geo_gauss_function_score	0	0
地理范围查询（基于高斯衰减函数，且脚本动态获取字段值）	Min Throughput	ops/s	decay_geo_gauss_script_score	1	1
	Median Throughput	ops/s	decay_geo_gauss_script_score	1	1
	Max Throughput	ops/s	decay_geo_gauss_script_score	1	1
	50th percentile latency	ms	decay_geo_gauss_script_score	341.152	344.4
	90th percentile latency	ms	decay_geo_gauss_script_score	349.94	371.5
	99th percentile latency	ms	decay_geo_gauss_script_score	354.76	420.6

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile latency	ms	decay_geo_gauss_script_score	364.169	438.5
	50th percentile service time	ms	decay_geo_gauss_script_score	339.967	342.9
	90th percentile service time	ms	decay_geo_gauss_script_score	348.493	370.1
	99th percentile service time	ms	decay_geo_gauss_script_score	353.559	418.7
	100th percentile service time	ms	decay_geo_gauss_script_score	362.748	437.1
	error rate	%	decay_geo_gauss_script_score	0	0
自定义评分函数查询 (基于字段值定义函数)	Min Throughput	ops/s	field_value_function_score	1.5	1.5
	Median Throughput	ops/s	field_value_function_score	1.5	1.5
	Max Throughput	ops/s	field_value_function_score	1.51	1.51
	50th percentile latency	ms	field_value_function_score	120.538	129.3
	90th percentile latency	ms	field_value_function_score	137.702	152.9

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile latency	ms	field_value_function_score	147.851	185.7
	100th percentile latency	ms	field_value_function_score	169.961	186.4
	50th percentile service time	ms	field_value_function_score	119.159	128.1
	90th percentile service time	ms	field_value_function_score	136.338	151.5
	99th percentile service time	ms	field_value_function_score	146.981	184.9
	100th percentile service time	ms	field_value_function_score	168.964	185.2
	error rate	%	field_value_function_score	0	0
自定义评分函数查询 (通过脚本动态获取 字段值计算评分)	Min Throughput	ops/s	field_value_script_score	1.5	1.5
	Median Throughput	ops/s	field_value_script_score	1.5	1.5
	Max Throughput	ops/s	field_value_script_score	1.51	1.51
	50th percentile latency	ms	field_value_script_score	168.069	171.9

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile latency	ms	field_value_script_score	178.933	184.4
	99th percentile latency	ms	field_value_script_score	196.982	200.1
	100th percentile latency	ms	field_value_script_score	198.722	206.4
	50th percentile service time	ms	field_value_script_score	166.827	170.6
	90th percentile service time	ms	field_value_script_score	177.869	183.3
	99th percentile service time	ms	field_value_script_score	195.586	199.1
	100th percentile service time	ms	field_value_script_score	197.054	205.3
	error rate	%	field_value_script_score	0	0
大量 terms 条件查询 (query)	Min Throughput	ops/s	large_terms	1.1	1.1
	Median Throughput	ops/s	large_terms	1.1	1.1
	Max Throughput	ops/s	large_terms	1.1	1.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile latency	ms	large_terms	241.322	597.4
	90th percentile latency	ms	large_terms	252.637	600.9
	99th percentile latency	ms	large_terms	265.807	749.8
	100th percentile latency	ms	large_terms	272.611	751.4
	50th percentile service time	ms	large_terms	233.129	589.8
	90th percentile service time	ms	large_terms	244.494	593.5
	99th percentile service time	ms	large_terms	258.894	742.6
	100th percentile service time	ms	large_terms	264.352	743.9
	error rate	%	large_terms	0	0
大量 terms 条件过滤查询 (query、filter)	Min Throughput	ops/s	large_filtered_terms	1.1	1.1
	Median Throughput	ops/s	large_filtered_terms	1.1	1.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	Max Throughput	ops/s	large_filtered_terms	1.1	1.1
	50th percentile latency	ms	large_filtered_terms	233.192	596.0
	90th percentile latency	ms	large_filtered_terms	241.102	604.3
	99th percentile latency	ms	large_filtered_terms	251.835	717.0
	100th percentile latency	ms	large_filtered_terms	260.27	749.6
	50th percentile service time	ms	large_filtered_terms	225.052	588.2
	90th percentile service time	ms	large_filtered_terms	233.16	595.4
	99th percentile service time	ms	large_filtered_terms	243.603	708.9
	100th percentile service time	ms	large_filtered_terms	252.129	741.9
	error rate	%	large_filtered_terms	0	0
大量条件取反查询 (query、must not)	Min Throughput	ops/s	large_prohibited_terms	1.1	1.1

说明	Metric	Unit	Task	腾讯云ES	社区版
	Median Throughput	ops/s	large_prohibited_terms	1.1	1.1
	Max Throughput	ops/s	large_prohibited_terms	1.1	1.1
	50th percentile latency	ms	large_prohibited_terms	235.179	610.4
	90th percentile latency	ms	large_prohibited_terms	241.076	631.5
	99th percentile latency	ms	large_prohibited_terms	255.983	774.9
	100th percentile latency	ms	large_prohibited_terms	259.046	779.1
	50th percentile service time	ms	large_prohibited_terms	227.487	603.3
	90th percentile service time	ms	large_prohibited_terms	233.792	624.5
	99th percentile service time	ms	large_prohibited_terms	248.53	767.5
	100th percentile service time	ms	large_prohibited_terms	251.083	771.6
	error rate	%	large_prohibited_terms	0	0

说明	Metric	Unit	Task	腾讯云ES	社区版
降序排序查询	Min Throughput	ops/s	desc_sort_population	1.5	1.5
	Median Throughput	ops/s	desc_sort_population	1.51	1.51
	Max Throughput	ops/s	desc_sort_population	1.51	1.51
	50th percentile latency	ms	desc_sort_population	48.387	56.66
	90th percentile latency	ms	desc_sort_population	63.073	94.97
	99th percentile latency	ms	desc_sort_population	71.7498	97.26
	100th percentile latency	ms	desc_sort_population	83.3593	97.78
	50th percentile service time	ms	desc_sort_population	47.0436	55.14
	90th percentile service time	ms	desc_sort_population	61.3731	93.91
	99th percentile service time	ms	desc_sort_population	70.4811	95.61

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile service time	ms	desc_sort_population	81.6517	96.00
	error rate	%	desc_sort_population	0	0
升序排序查询	Min Throughput	ops/s	asc_sort_population	1.5	1.5
	Median Throughput	ops/s	asc_sort_population	1.51	1.51
	Max Throughput	ops/s	asc_sort_population	1.51	1.51
	50th percentile latency	ms	asc_sort_population	49.2469	57.91
	90th percentile latency	ms	asc_sort_population	67.5894	76.00
	99th percentile latency	ms	asc_sort_population	84.6384	97.51
	100th percentile latency	ms	asc_sort_population	85.8124	97.56
	50th percentile service time	ms	asc_sort_population	47.8438	56.58
	90th percentile service time	ms	asc_sort_population	66.0821	74.73

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile service time	ms	asc_sort_population	83.6026	96.28
	100th percentile service time	ms	asc_sort_population	84.2175	96.65
	error rate	%	asc_sort_population	0	0
升序排序后 after 跳转查询	Min Throughput	ops/s	asc_sort_with_after_population	1.5	1.5
	Median Throughput	ops/s	asc_sort_with_after_population	1.51	1.51
	Max Throughput	ops/s	asc_sort_with_after_population	1.51	1.51
	50th percentile latency	ms	asc_sort_with_after_population	99.1943	83.42
	90th percentile latency	ms	asc_sort_with_after_population	86.0298	98.89
	99th percentile latency	ms	asc_sort_with_after_population	102.268	131.5
	100th percentile latency	ms	asc_sort_with_after_population	106.33	132.2
	50th percentile service time	ms	asc_sort_with_after_population	68.2272	82.12

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile service time	ms	asc_sort_with_after_population	84.685	97.20
	99th percentile service time	ms	asc_sort_with_after_population	101.133	130.0
	100th percentile service time	ms	asc_sort_with_after_population	105.094	131.2
	error rate	%	asc_sort_with_after_population	0	0
高基字段降序排序查询（基于DistanceFeatureQuery快速取 topK）	Min Throughput	ops/s	desc_sort_geonameid	6.02	6.02
	Median Throughput	ops/s	desc_sort_geonameid	6.02	6.02
	Max Throughput	ops/s	desc_sort_geonameid	6.03	6.03
	50th percentile latency	ms	desc_sort_geonameid	5.53008	5.153
	90th percentile latency	ms	desc_sort_geonameid	6.20276	6.055
	99th percentile latency	ms	desc_sort_geonameid	6.67673	7.419
	100th percentile latency	ms	desc_sort_geonameid	6.95103	24.17

说明	Metric	Unit	Task	腾讯云ES	社区版
	50th percentile service time	ms	desc_sort_geonameid	4.61231	4.389
	90th percentile service time	ms	desc_sort_geonameid	5.45982	5.203
	99th percentile service time	ms	desc_sort_geonameid	5.65304	5.752
	100th percentile service time	ms	desc_sort_geonameid	5.65578	23.31
	error rate	%	desc_sort_geonameid	0	0
高基字段降序排序 after 跳转查询	Min Throughput	ops/s	desc_sort_with_after_geonameid	6.01	6.01
	Median Throughput	ops/s	desc_sort_with_after_geonameid	6.02	6.01
	Max Throughput	ops/s	desc_sort_with_after_geonameid	6.02	6.02
	50th percentile latency	ms	desc_sort_with_after_geonameid	56.5947	75.93
	90th percentile latency	ms	desc_sort_with_after_geonameid	79.6503	88.62
	99th percentile latency	ms	desc_sort_with_after_geonameid	87.7773	117.7

说明	Metric	Unit	Task	腾讯云ES	社区版
	100th percentile latency	ms	desc_sort_with_after_geonameid	89.3947	118.0
	50th percentile service time	ms	desc_sort_with_after_geonameid	55.4855	75.12
	90th percentile service time	ms	desc_sort_with_after_geonameid	79.2349	87.72
	99th percentile service time	ms	desc_sort_with_after_geonameid	87.3803	116.9
	100th percentile service time	ms	desc_sort_with_after_geonameid	88.3606	117.7
	error rate	%	desc_sort_with_after_geonameid	0	0
高基字段升序排序查询（基于 DistanceFeatureQuery 快速取 topK）	Min Throughput	ops/s	asc_sort_geonameid	6.02	6.02
	Median Throughput	ops/s	asc_sort_geonameid	6.02	6.02
	Max Throughput	ops/s	asc_sort_geonameid	6.03	6.03
	50th percentile latency	ms	asc_sort_geonameid	5.19317	4.491
	90th percentile latency	ms	asc_sort_geonameid	5.74438	5.017

说明	Metric	Unit	Task	腾讯云ES	社区版
	99th percentile latency	ms	asc_sort_geonameid	6.22846	5.496
	100th percentile latency	ms	asc_sort_geonameid	11.6377	5.535
	50th percentile service time	ms	asc_sort_geonameid	4.35586	3.565
	90th percentile service time	ms	asc_sort_geonameid	4.92152	3.971
	99th percentile service time	ms	asc_sort_geonameid	5.38949	4.335
	100th percentile service time	ms	asc_sort_geonameid	10.6436	4.566
	error rate	%	asc_sort_geonameid	0	0
高基字段升序排序 after 跳转查询	Min Throughput	ops/s	asc_sort_with_after_geonameid	6.01	6.01
	Median Throughput	ops/s	asc_sort_with_after_geonameid	6.02	6.01
	Max Throughput	ops/s	asc_sort_with_after_geonameid	6.02	6.02
	50th percentile latency	ms	asc_sort_with_after_geonameid	58.1403	69.53

说明	Metric	Unit	Task	腾讯云ES	社区版
	90th percentile latency	ms	asc_sort_with_after_geonameid	76.5695	81.79
	99th percentile latency	ms	asc_sort_with_after_geonameid	91.6296	98.10
	100th percentile latency	ms	asc_sort_with_after_geonameid	91.6364	104.3
	50th percentile service time	ms	asc_sort_with_after_geonameid	57.1683	68.53
	90th percentile service time	ms	asc_sort_with_after_geonameid	75.7573	81.01
	99th percentile service time	ms	asc_sort_with_after_geonameid	91.1533	97.80
	100th percentile service time	ms	asc_sort_with_after_geonameid	91.3662	103.4
	error rate	%	asc_sort_with_after_geonameid	0	0

4核16G 3节点与8核32G 3节点集群压测结果比较

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本文提供4核16G SSD 200G 3个节点与8核32G SSD 200G 3个节点规格的腾讯云 Elasticsearch Service 集群的压测比较结果。

说明：

数据为官方提供的 [geonames](#)，包含11396503条地理位置信息，总大小接近3GB，包含了 text、long、geo 等类型数据，覆盖行列存。

说明	Metric	Unit	Task	4核16GB	8核32GB
写入总耗时	Cumulative indexing time of primary shards	min	-	16.3633	14.25
GC 总次数、耗时统计	Total Young Gen GC time	s	-	6.26	3.544
	Total Young Gen GC count	次	-	892	447
	Total Old Gen GC time	s	-	0	0
	Total Old Gen GC count	次	-	0	0
存储大小	Store size	GB	-	2.51866	2.597
堆内存使用量	Heap used for segments	MB	-	0.803783	0.534

说明	Metric	Unit	Task	4核16GB	8核32GB
	Heap used for doc values	MB	-	0.0284767	0.0500000
	Heap used for terms	MB	-	0.655075	0.370000
	Heap used for norms	MB	-	0.0732422	0.039000
	Heap used for points	MB	-	0	0
	Heap used for stored fields	MB	-	0.0469894	0.011000
segment 总数量	Segment count	次	-	6	7
写入吞吐、耗时统计	Min Throughput	docs/s	index-append	89331.9	1537
	Median Throughput	docs/s	index-append	90268.8	1597
	Max Throughput	docs/s	index-append	90516.1	1627
	50th percentile latency	ms	index-append	233.258	130.8
	90th percentile latency	ms	index-append	314.558	162.9
	99th percentile latency	ms	index-append	341.303	181.4
	100th percentile latency	ms	index-append	354.657	225.9

说明	Metric	Unit	Task	4核16GB	8核32GB
	50th percentile service time	ms	index-append	233.258	130.8
	90th percentile service time	ms	index-append	314.558	162.9
	99th percentile service time	ms	index-append	341.303	181.4
	100th percentile service time	ms	index-append	354.657	225.9
	error rate	%	index-append	0	0
index 指标统计	Min Throughput	ops/s	index-stats	90.04	90.05
	Median Throughput	ops/s	index-stats	90.07	90.06
	Max Throughput	ops/s	index-stats	90.14	90.12
	50th percentile latency	ms	index-stats	2.91003	2.767
	90th percentile latency	ms	index-stats	3.82882	3.582
	99th percentile latency	ms	index-stats	4.2378	3.957

说明	Metric	Unit	Task	4核16GB	8核32GB
	99.9th percentile latency	ms	index-stats	4.34459	4.393
	100th percentile latency	ms	index-stats	8.22393	9.003
	50th percentile service time	ms	index-stats	1.78268	1.577
	90th percentile service time	ms	index-stats	2.07484	1.831
	99th percentile service time	ms	index-stats	2.43121	2.075
	99.9th percentile service time	ms	index-stats	3.09198	2.248
	100th percentile service time	ms	index-stats	7.29974	2.310
	error rate	%	index-stats	0	0
node 指标统计	Min Throughput	ops/s	node-stats	90.06	90.06
	Median Throughput	ops/s	node-stats	90.09	90.12
	Max Throughput	ops/s	node-stats	90.34	90.36

说明	Metric	Unit	Task	4核16GB	8核32GB
	50th percentile latency	ms	node-stats	3.17223	2.975
	90th percentile latency	ms	node-stats	3.70681	4.079
	99th percentile latency	ms	node-stats	5.01334	5.075
	99.9th percentile latency	ms	node-stats	6.75018	6.536
	100th percentile latency	ms	node-stats	7.98905	6.934
	50th percentile service time	ms	node-stats	2.43876	2.238
	90th percentile service time	ms	node-stats	2.78272	2.653
	99th percentile service time	ms	node-stats	4.12234	3.920
	99.9th percentile service time	ms	node-stats	6.35902	4.928
	100th percentile service time	ms	node-stats	7.4313	5.927

说明	Metric	Unit	Task	4核16GB	8核32GB
	error rate	%	node-stats	0	0
默认查询，所有文档 score 为1 (match_all)	Min Throughput	ops/s	default	50.03	50.03
	Median Throughput	ops/s	default	50.04	50.04
	Max Throughput	ops/s	default	50.08	50.08
	50th percentile latency	ms	default	3.89929	3.538
	90th percentile latency	ms	default	4.39236	4.114
	99th percentile latency	ms	default	4.78834	4.927
	99.9th percentile latency	ms	default	7.10486	5.740
	100th percentile latency	ms	default	8.75822	7.325
	50th percentile service time	ms	default	3.18269	2.783
	90th percentile service time	ms	default	3.49347	3.173
	99th percentile service time	ms	default	3.8746	3.774

说明	Metric	Unit	Task	4核16GB	8核32GB
	99.9th percentile service time	ms	default	6.68581	4.191
	100th percentile service time	ms	default	8.30396	6.582
	error rate	%	default	0	0
term 条件查询	Min Throughput	ops/s	term	100.05	99.66
	Median Throughput	ops/s	term	100.07	100.0
	Max Throughput	ops/s	term	100.14	100.1
	50th percentile latency	ms	term	3.17419	2.839
	90th percentile latency	ms	term	3.62229	3.325
	99th percentile latency	ms	term	4.03812	3.960
	99.9th percentile latency	ms	term	5.9753	4.339
	100th percentile latency	ms	term	8.03321	5.704
	50th percentile service time	ms	term	2.49755	2.089

说明	Metric	Unit	Task	4核16GB	8核32GB
	90th percentile service time	ms	term	2.71322	2.532
	99th percentile service time	ms	term	3.20673	2.994
	99.9th percentile service time	ms	term	5.17998	3.377
	100th percentile service time	ms	term	6.95227	5.240
	error rate	%	term	0	0
词组查询（query）	Min Throughput	ops/s	phrase	110.05	110.0
	Median Throughput	ops/s	phrase	110.07	110.0
	Max Throughput	ops/s	phrase	110.12	110.1
	50th percentile latency	ms	phrase	3.09905	2.740
	90th percentile latency	ms	phrase	3.62549	3.302
	99th percentile latency	ms	phrase	4.55457	4.812

说明	Metric	Unit	Task	4核16GB	8核32GB
	99.9th percentile latency	ms	phrase	8.29519	5.572
	100th percentile latency	ms	phrase	9.39771	6.545
	50th percentile service time	ms	phrase	2.38248	1.988
	90th percentile service time	ms	phrase	2.77084	2.413
	99th percentile service time	ms	phrase	3.75448	4.001
	99.9th percentile service time	ms	phrase	7.5974	4.707
	100th percentile service time	ms	phrase	8.98362	5.678
	error rate	%	phrase	0	0
不带缓存的聚合查询 (aggregation)	Min Throughput	ops/s	country_agg_uncached	3.6	3.6
	Median Throughput	ops/s	country_agg_uncached	3.61	3.61
	Max Throughput	ops/s	country_agg_uncached	3.61	3.61

说明	Metric	Unit	Task	4核16GB	8核32GB
	50th percentile latency	ms	country_agg_uncached	157.466	130.3
	90th percentile latency	ms	country_agg_uncached	217.148	147.5
	99th percentile latency	ms	country_agg_uncached	233.185	165.1
	100th percentile latency	ms	country_agg_uncached	233.227	174.0
	50th percentile service time	ms	country_agg_uncached	156.197	129.1
	90th percentile service time	ms	country_agg_uncached	215.852	146.9
	99th percentile service time	ms	country_agg_uncached	232.177	164.5
	100th percentile service time	ms	country_agg_uncached	232.321	172.8
	error rate	%	country_agg_uncached	0	0
带缓存的聚合查询 (aggregation)	Min Throughput	ops/s	country_agg_cached	100.03	100.0
	Median Throughput	ops/s	country_agg_cached	100.05	100.0

说明	Metric	Unit	Task	4核16GB	8核32GB
	Max Throughput	ops/s	country_agg_cached	100.08	100.08
	50th percentile latency	ms	country_agg_cached	2.44457	2.295
	90th percentile latency	ms	country_agg_cached	2.97922	3.574
	99th percentile latency	ms	country_agg_cached	3.96393	3.916
	99.9th percentile latency	ms	country_agg_cached	5.3294	4.197
	100th percentile latency	ms	country_agg_cached	7.9529	4.518
	50th percentile service time	ms	country_agg_cached	1.71924	1.578
	90th percentile service time	ms	country_agg_cached	1.97892	1.891
	99th percentile service time	ms	country_agg_cached	2.22611	2.194
	99.9th percentile service time	ms	country_agg_cached	5.0967	3.425

说明	Metric	Unit	Task	4核16GB	8核32GB
	100th percentile service time	ms	country_agg_cached	7.02246	4.289
	error rate	%	country_agg_cached	0	0
分页拉取	Min Throughput	pages/s	scroll	20.04	20.04
	Median Throughput	pages/s	scroll	20.04	20.05
	Max Throughput	pages/s	scroll	20.05	20.06
	50th percentile latency	ms	scroll	576.675	538.4
	90th percentile latency	ms	scroll	585.156	543.5
	99th percentile latency	ms	scroll	598.95	582.2
	100th percentile latency	ms	scroll	602.009	584.7
	50th percentile service time	ms	scroll	575.118	537.0
	90th percentile service time	ms	scroll	583.906	542.4

说明	Metric	Unit	Task	4核16GB	8核32GB
	99th percentile service time	ms	scroll	597.482	580.5
	100th percentile service time	ms	scroll	600.578	583.6
	error rate	%	scroll	0	0
脚本查询（使用 expression 脚本）	Min Throughput	ops/s	expression	2	2
	Median Throughput	ops/s	expression	2	2
	Max Throughput	ops/s	expression	2	2
	50th percentile latency	ms	expression	299.685	265.6
	90th percentile latency	ms	expression	416.613	287.1
	99th percentile latency	ms	expression	465.776	311.7
	100th percentile latency	ms	expression	468.083	391.7
	50th percentile service time	ms	expression	298.594	264.4

说明	Metric	Unit	Task	4核16GB	8核32GB
	90th percentile service time	ms	expression	415.045	285.1
	99th percentile service time	ms	expression	464.598	310.9
	100th percentile service time	ms	expression	467.106	390.3
	error rate	%	expression	0	0
脚本查询（使用painless 静态脚本，不动态取字段值）	Min Throughput	ops/s	painless_static	1.5	1.5
	Median Throughput	ops/s	painless_static	1.5	1.5
	Max Throughput	ops/s	painless_static	1.5	1.5
	50th percentile latency	ms	painless_static	383.485	337.9
	90th percentile latency	ms	painless_static	514.495	358.7
	99th percentile latency	ms	painless_static	561.342	375.0
	100th percentile latency	ms	painless_static	568.066	395.4

说明	Metric	Unit	Task	4核16GB	8核32GB
	50th percentile service time	ms	painless_static	382.158	337.1
	90th percentile service time	ms	painless_static	513.202	357.7
	99th percentile service time	ms	painless_static	560.61	374.1
	100th percentile service time	ms	painless_static	567.419	394.6
	error rate	%	painless_static	0	0
脚本查询（使用painless 静态脚本，动态获取字段值）	Min Throughput	ops/s	painless_dynamic	1.5	1.5
	Median Throughput	ops/s	painless_dynamic	1.5	1.5
	Max Throughput	ops/s	painless_dynamic	1.5	1.5
	50th percentile latency	ms	painless_dynamic	377.278	334.6
	90th percentile latency	ms	painless_dynamic	517.496	354.4
	99th percentile latency	ms	painless_dynamic	576.697	377.2

说明	Metric	Unit	Task	4核16GB	8核32GB
	100th percentile latency	ms	painless_dynamic	580.017	381.2
	50th percentile service time	ms	painless_dynamic	376.339	333.6
	90th percentile service time	ms	painless_dynamic	516.407	353.2
	99th percentile service time	ms	painless_dynamic	575.714	375.9
	100th percentile service time	ms	painless_dynamic	579.642	379.7
	error rate	%	painless_dynamic	0	0
地理范围查询（基于高斯衰减函数）	Min Throughput	ops/s	decay_geo_gauss_function_score	1	1
	Median Throughput	ops/s	decay_geo_gauss_function_score	1	1
	Max Throughput	ops/s	decay_geo_gauss_function_score	1	1
	50th percentile latency	ms	decay_geo_gauss_function_score	348.531	327.9
	90th percentile latency	ms	decay_geo_gauss_function_score	398.351	336.9

说明	Metric	Unit	Task	4核16GB	8核32GB
	99th percentile latency	ms	decay_geo_gauss_function_score	411.483	343.5
	100th percentile latency	ms	decay_geo_gauss_function_score	457.615	344.1
	50th percentile service time	ms	decay_geo_gauss_function_score	346.881	326.5
	90th percentile service time	ms	decay_geo_gauss_function_score	397.08	336.0
	99th percentile service time	ms	decay_geo_gauss_function_score	410.421	342.1
	100th percentile service time	ms	decay_geo_gauss_function_score	455.704	342.8
	error rate	%	decay_geo_gauss_function_score	0	0
地理范围查询（基于高斯衰减函数，且脚本动态获取字段值）	Min Throughput	ops/s	decay_geo_gauss_script_score	1	1
	Median Throughput	ops/s	decay_geo_gauss_script_score	1	1
	Max Throughput	ops/s	decay_geo_gauss_script_score	1	1
	50th percentile latency	ms	decay_geo_gauss_script_score	368.275	341.1

说明	Metric	Unit	Task	4核16GB	8核32GB
	90th percentile latency	ms	decay_geo_gauss_script_score	414.905	349.9
	99th percentile latency	ms	decay_geo_gauss_script_score	468.888	354.7
	100th percentile latency	ms	decay_geo_gauss_script_score	477.25	364.1
	50th percentile service time	ms	decay_geo_gauss_script_score	366.945	339.9
	90th percentile service time	ms	decay_geo_gauss_script_score	413.609	348.4
	99th percentile service time	ms	decay_geo_gauss_script_score	467.627	353.5
	100th percentile service time	ms	decay_geo_gauss_script_score	475.367	362.7
	error rate	%	decay_geo_gauss_script_score	0	0
自定义评分函数查询 (基于字段值定义函数)	Min Throughput	ops/s	field_value_function_score	1.5	1.5
	Median Throughput	ops/s	field_value_function_score	1.5	1.5
	Max Throughput	ops/s	field_value_function_score	1.51	1.51

说明	Metric	Unit	Task	4核16GB	8核32GB
	50th percentile latency	ms	field_value_function_score	139.661	120.5
	90th percentile latency	ms	field_value_function_score	183.675	137.7
	99th percentile latency	ms	field_value_function_score	197.653	147.8
	100th percentile latency	ms	field_value_function_score	202.345	169.9
	50th percentile service time	ms	field_value_function_score	138.423	119.1
	90th percentile service time	ms	field_value_function_score	182.404	136.3
	99th percentile service time	ms	field_value_function_score	196.734	146.9
	100th percentile service time	ms	field_value_function_score	201.442	168.9
	error rate	%	field_value_function_score	0	0
自定义评分函数查询 (通过脚本动态获取 字段值计算评分)	Min Throughput	ops/s	field_value_script_score	1.5	1.5
	Median Throughput	ops/s	field_value_script_score	1.5	1.5

说明	Metric	Unit	Task	4核16GB	8核32GB
	Max Throughput	ops/s	field_value_script_score	1.51	1.51
	50th percentile latency	ms	field_value_script_score	188.952	168.0
	90th percentile latency	ms	field_value_script_score	264.095	178.9
	99th percentile latency	ms	field_value_script_score	271.153	196.9
	100th percentile latency	ms	field_value_script_score	271.901	198.7
	50th percentile service time	ms	field_value_script_score	187.218	166.8
	90th percentile service time	ms	field_value_script_score	263.207	177.8
	99th percentile service time	ms	field_value_script_score	269.578	195.5
	100th percentile service time	ms	field_value_script_score	270.138	197.0
	error rate	%	field_value_script_score	0	0
大量 terms 条件查询 (query)	Min Throughput	ops/s	large_terms	1.1	1.1

说明	Metric	Unit	Task	4核16GB	8核32GB
	Median Throughput	ops/s	large_terms	1.1	1.1
	Max Throughput	ops/s	large_terms	1.1	1.1
	50th percentile latency	ms	large_terms	265.007	241.5
	90th percentile latency	ms	large_terms	296.009	252.6
	99th percentile latency	ms	large_terms	310.358	265.8
	100th percentile latency	ms	large_terms	311.049	272.6
	50th percentile service time	ms	large_terms	256.372	233.1
	90th percentile service time	ms	large_terms	287.851	244.4
	99th percentile service time	ms	large_terms	301.827	258.8
	100th percentile service time	ms	large_terms	302.251	264.5
	error rate	%	large_terms	0	0

说明	Metric	Unit	Task	4核16GB	8核32GB
大量 terms 条件过滤查询（query、filter）	Min Throughput	ops/s	large_filtered_terms	1.1	1.1
	Median Throughput	ops/s	large_filtered_terms	1.1	1.1
	Max Throughput	ops/s	large_filtered_terms	1.1	1.1
	50th percentile latency	ms	large_filtered_terms	268.135	233.1
	90th percentile latency	ms	large_filtered_terms	304.158	241.1
	99th percentile latency	ms	large_filtered_terms	351.209	251.8
	100th percentile latency	ms	large_filtered_terms	352.003	260.2
	50th percentile service time	ms	large_filtered_terms	259.546	225.0
	90th percentile service time	ms	large_filtered_terms	295.721	233.1
	99th percentile service time	ms	large_filtered_terms	342.342	243.6
	100th percentile service time	ms	large_filtered_terms	343.378	252.1

说明	Metric	Unit	Task	4核16GB	8核32GB
	error rate	%	large_filtered_terms	0	0
大量条件取反查询 (query、must not)	Min Throughput	ops/s	large_prohibited_terms	1.1	1.1
	Median Throughput	ops/s	large_prohibited_terms	1.1	1.1
	Max Throughput	ops/s	large_prohibited_terms	1.1	1.1
	50th percentile latency	ms	large_prohibited_terms	270.041	235.1
	90th percentile latency	ms	large_prohibited_terms	310.351	241.0
	99th percentile latency	ms	large_prohibited_terms	347.414	255.9
	100th percentile latency	ms	large_prohibited_terms	349.499	259.0
	50th percentile service time	ms	large_prohibited_terms	261.734	227.4
	90th percentile service time	ms	large_prohibited_terms	302.279	233.7
	99th percentile service time	ms	large_prohibited_terms	339.278	248.5

说明	Metric	Unit	Task	4核16GB	8核32GB
	100th percentile service time	ms	large_prohibited_terms	340.817	251.0
	error rate	%	large_prohibited_terms	0	0
降序排序查询	Min Throughput	ops/s	desc_sort_population	1.5	1.5
	Median Throughput	ops/s	desc_sort_population	1.51	1.51
	Max Throughput	ops/s	desc_sort_population	1.51	1.51
	50th percentile latency	ms	desc_sort_population	58.5828	48.38
	90th percentile latency	ms	desc_sort_population	77.9981	63.07
	99th percentile latency	ms	desc_sort_population	80.8863	71.74
	100th percentile latency	ms	desc_sort_population	83.1661	83.35
	50th percentile service time	ms	desc_sort_population	57.1212	47.04
	90th percentile service time	ms	desc_sort_population	76.7082	61.37

说明	Metric	Unit	Task	4核16GB	8核32GB
	99th percentile service time	ms	desc_sort_population	79.2907	70.48
	100th percentile service time	ms	desc_sort_population	81.6364	81.65
	error rate	%	desc_sort_population	0	0
升序排序查询	Min Throughput	ops/s	asc_sort_population	1.5	1.5
	Median Throughput	ops/s	asc_sort_population	1.51	1.51
	Max Throughput	ops/s	asc_sort_population	1.51	1.51
	50th percentile latency	ms	asc_sort_population	62.4328	49.24
	90th percentile latency	ms	asc_sort_population	79.8441	67.58
	99th percentile latency	ms	asc_sort_population	83.9411	84.63
	100th percentile latency	ms	asc_sort_population	84.3925	85.81
	50th percentile service time	ms	asc_sort_population	61.0637	47.84

说明	Metric	Unit	Task	4核16GB	8核32GB
	90th percentile service time	ms	asc_sort_population	78.4101	66.06
	99th percentile service time	ms	asc_sort_population	82.2652	83.60
	100th percentile service time	ms	asc_sort_population	82.5616	84.21
	error rate	%	asc_sort_population	0	0
升序排序后 after 跳转查询	Min Throughput	ops/s	asc_sort_with_after_population	1.5	1.5
	Median Throughput	ops/s	asc_sort_with_after_population	1.51	1.51
	Max Throughput	ops/s	asc_sort_with_after_population	1.51	1.51
	50th percentile latency	ms	asc_sort_with_after_population	88.1871	99.19
	90th percentile latency	ms	asc_sort_with_after_population	127.995	86.02
	99th percentile latency	ms	asc_sort_with_after_population	131.171	102.2
	100th percentile latency	ms	asc_sort_with_after_population	132.181	106.3

说明	Metric	Unit	Task	4核16GB	8核32GB
	50th percentile service time	ms	asc_sort_with_after_population	87.132	68.22
	90th percentile service time	ms	asc_sort_with_after_population	126.818	84.68
	99th percentile service time	ms	asc_sort_with_after_population	129.453	101.1
	100th percentile service time	ms	asc_sort_with_after_population	130.452	105.0
	error rate	%	asc_sort_with_after_population	0	0
高基字段降序排序查询（基于 DistanceFeatureQuery 快速取 topK）	Min Throughput	ops/s	desc_sort_geonameid	6.02	6.02
	Median Throughput	ops/s	desc_sort_geonameid	6.02	6.02
	Max Throughput	ops/s	desc_sort_geonameid	6.03	6.03
	50th percentile latency	ms	desc_sort_geonameid	7.4659	5.530
	90th percentile latency	ms	desc_sort_geonameid	8.26766	6.202
	99th percentile latency	ms	desc_sort_geonameid	8.72369	6.676

说明	Metric	Unit	Task	4核16GB	8核32GB
	100th percentile latency	ms	desc_sort_geonameid	8.79956	6.951
	50th percentile service time	ms	desc_sort_geonameid	6.59986	4.612
	90th percentile service time	ms	desc_sort_geonameid	7.24539	5.459
	99th percentile service time	ms	desc_sort_geonameid	7.57925	5.653
	100th percentile service time	ms	desc_sort_geonameid	7.64471	5.655
	error rate	%	desc_sort_geonameid	0	0
高基字段降序排序 after 跳转查询	Min Throughput	ops/s	desc_sort_with_after_geonameid	6.01	6.01
	Median Throughput	ops/s	desc_sort_with_after_geonameid	6.01	6.02
	Max Throughput	ops/s	desc_sort_with_after_geonameid	6.02	6.02
	50th percentile latency	ms	desc_sort_with_after_geonameid	89.4587	56.59
	90th percentile latency	ms	desc_sort_with_after_geonameid	119.777	79.65

说明	Metric	Unit	Task	4核16GB	8核32GB
	99th percentile latency	ms	desc_sort_with_after_geonameid	123.271	87.77
	100th percentile latency	ms	desc_sort_with_after_geonameid	123.628	89.39
	50th percentile service time	ms	desc_sort_with_after_geonameid	88.512	55.48
	90th percentile service time	ms	desc_sort_with_after_geonameid	118.72	79.23
	99th percentile service time	ms	desc_sort_with_after_geonameid	122.79	87.38
	100th percentile service time	ms	desc_sort_with_after_geonameid	122.791	88.36
	error rate	%	desc_sort_with_after_geonameid	0	0
高基字段升序排序查询（基于 DistanceFeatureQuery 快速取 topK）	Min Throughput	ops/s	asc_sort_geonameid	6.02	6.02
	Median Throughput	ops/s	asc_sort_geonameid	6.02	6.02
	Max Throughput	ops/s	asc_sort_geonameid	6.03	6.03
	50th percentile latency	ms	asc_sort_geonameid	5.80593	5.193

说明	Metric	Unit	Task	4核16GB	8核32GB
	90th percentile latency	ms	asc_sort_geonameid	6.55438	5.744
	99th percentile latency	ms	asc_sort_geonameid	7.36432	6.228
	100th percentile latency	ms	asc_sort_geonameid	7.49672	11.63
	50th percentile service time	ms	asc_sort_geonameid	4.91916	4.355
	90th percentile service time	ms	asc_sort_geonameid	5.61126	4.921
	99th percentile service time	ms	asc_sort_geonameid	6.12285	5.385
	100th percentile service time	ms	asc_sort_geonameid	6.51222	10.64
	error rate	%	asc_sort_geonameid	0	0
高基字段升序排序 after 跳转查询	Min Throughput	ops/s	asc_sort_with_after_geonameid	6.01	6.01
	Median Throughput	ops/s	asc_sort_with_after_geonameid	6.01	6.02
	Max Throughput	ops/s	asc_sort_with_after_geonameid	6.01	6.02

说明	Metric	Unit	Task	4核16GB	8核32GB
	50th percentile latency	ms	asc_sort_with_after_geonameid	70.994	58.14
	90th percentile latency	ms	asc_sort_with_after_geonameid	104.817	76.56
	99th percentile latency	ms	asc_sort_with_after_geonameid	108.797	91.62
	100th percentile latency	ms	asc_sort_with_after_geonameid	108.929	91.63
	50th percentile service time	ms	asc_sort_with_after_geonameid	69.7056	57.16
	90th percentile service time	ms	asc_sort_with_after_geonameid	103.875	75.75
	99th percentile service time	ms	asc_sort_with_after_geonameid	107.828	91.15
	100th percentile service time	ms	asc_sort_with_after_geonameid	108.539	91.36
	error rate	%	asc_sort_with_after_geonameid	0	0

高级特性(X-Pack)

最近更新时间：2022-01-10 17:23:12

简介

高级特性，是指 Elasticsearch 官方商业特性（原 X-Pack 商业版插件包含的特性），包含了安全（Security）、SQL、机器学习（Machine Learning）、监控（Monitor）等高级功能，可以为 Elasticsearch 服务的应用开发和运维管理，提供更有力的帮助。腾讯云 ES 已提供了包含高级特性的版本，您可以在创建购买集群时选择，下文介绍各版本详细功能。

购买指引

Billing Mode

Pay-as-you-go ?

Elasticsearch Version

7.10.17.5.16.8.26.4.35.6.4

Advanced Features

Basic editionRecommendedPlatinum editionOpen-source edition ?

For platinum edition, the account permission verification feature of clusters will be enabled. In order to access clusters normally, you need to set an account password for actions such as Kibana login, Logstash and Beats log collecting, and access to a cluster client through API call. For details, see [Features of Each Edition](#)

如上图所示，在腾讯云 ES 创建购买页，有高级特性版本选项。腾讯云 ES 提供了3种可选的高级特性版本，版本说明如下：

对比项	基础版	白金版	开源版
是否包含 X-Pack	✓	✓	×
X-Pack 功能完整度	部分	全部	无

购买推荐

为了能够使用腾讯云 Elasticsearch 更多高级功能，我们建议您在创建购买集群时，选择**白金版**，各版本具体功能介绍及区别见下文，产品的定价信息详见 [产品定价](#)。

高级特性介绍

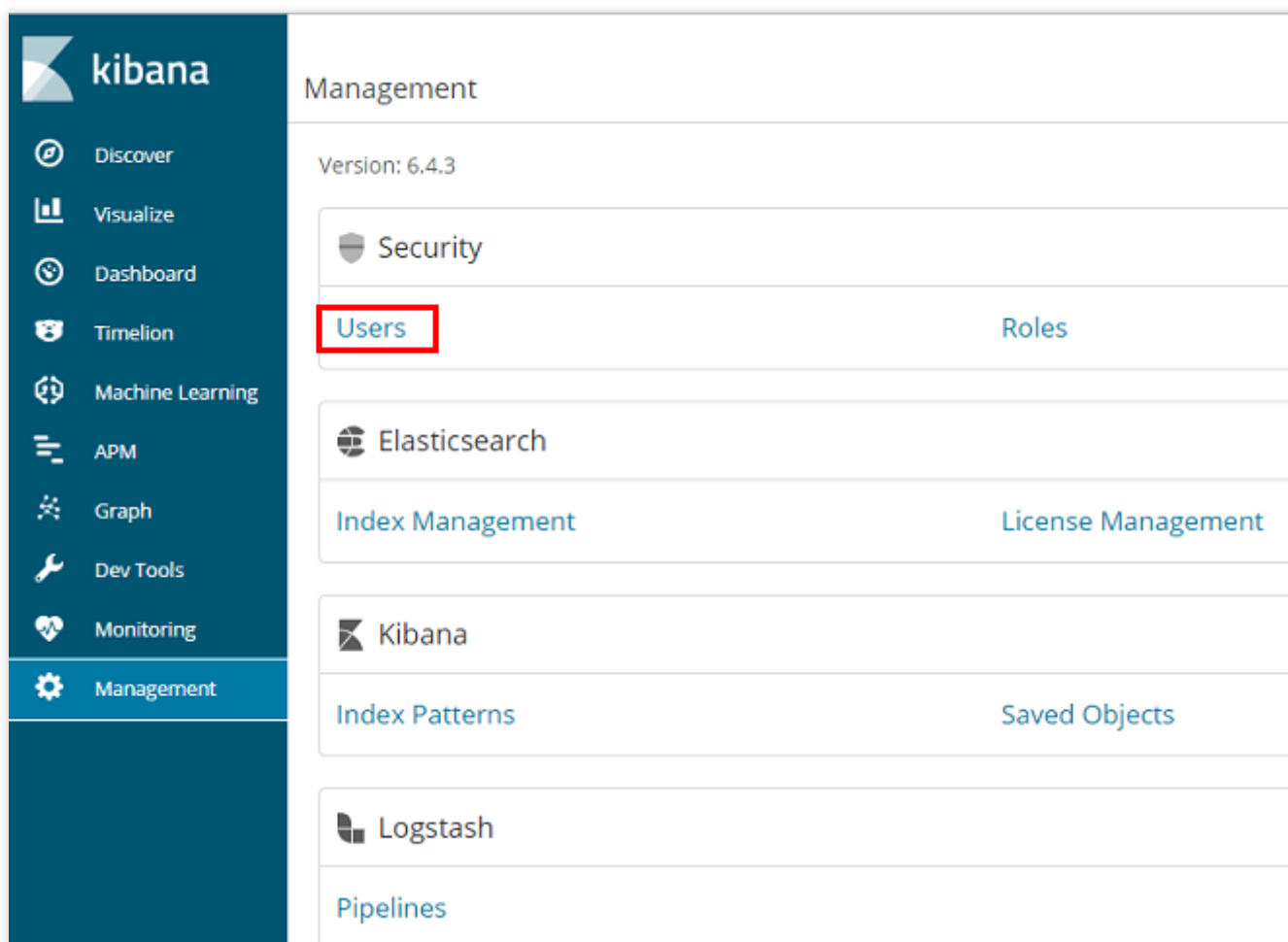
本文对部分常用高级特性进行了说明，完整的高级特性及说明，可查看官方说明 [Elastic Stack 订阅](#)、[API 文档](#)。

注意：

- 部分功能在不同的高级特性版本（基础、白金、开源）间有区别。
- 部分功能在较老的腾讯云 ES 版本不支持，若您遇到此问题可 [提工单](#) 咨询。

• 安全 (Security)

支持索引和字段级别读写等细分权限的控制管理，实现数据安全防护、业务访问隔离，向正确的人员授予访问权限，阻止恶意破坏和数据泄露，有效的保障数据安全。

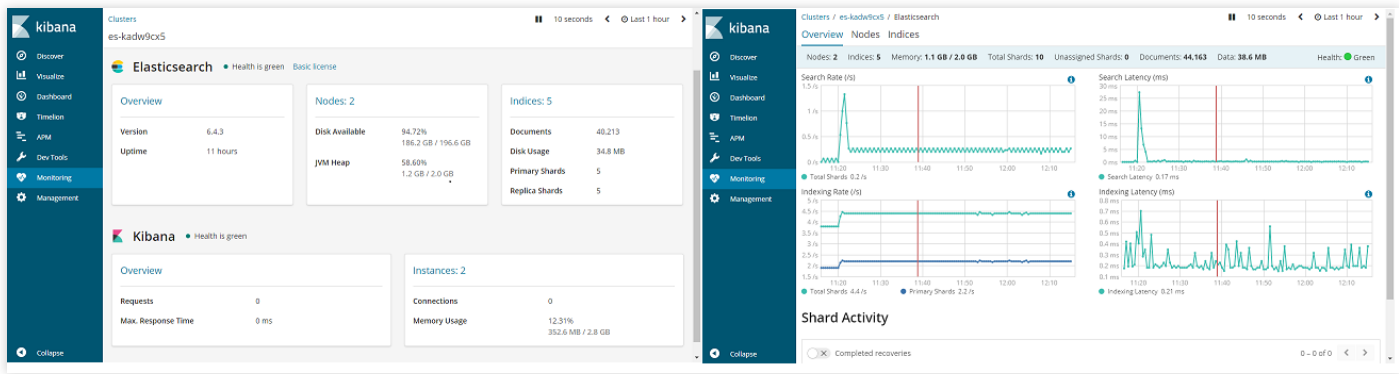


• 机器学习 (Machine Learning)

在自定义数据告警的应用场景中，对于较难设置规则和阈值来定义的变化，可通过结合非监督型机器学习来预测数据的变化趋势和合理的波动范围，在数据偏离正常变化趋势时，发出告警通知。

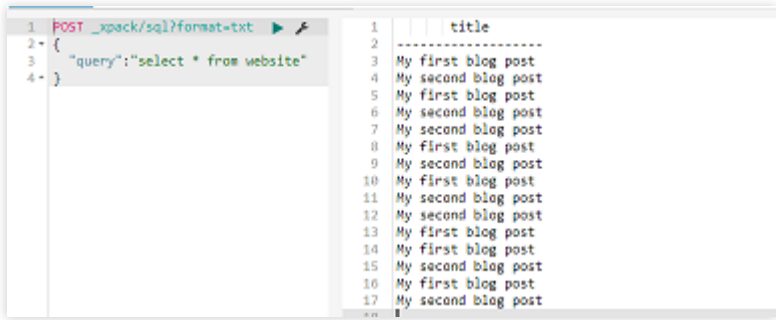
• 监控

集群、节点、索引多个维度，全方位监控，实时了解集群运行情况，辅助应用开发及运维。



SQL

提供了通过传统数据库 SQL 工具，实现对 Elasticsearch 数据进行全文检索、数据统计分析功能，支持 CLI、REST 等接入方式，白金版还支持 JDBC 连接。可以实现同原有业务系统的无缝对接，降低新技术学习成本。



SQL 支持方面，开源版集成了其他的 SQL 插件，详细了解和使用时可查看 [elasticsearch-sql](#)。

高级特性版本功能详细对比

本节主要对不同 ES 版本的部分重点功能做对比说明，方便用户了解不同版本中功能的区别。因 Elasticsearch 正处于快速发展阶段，不同版本对各功能的支持情况也在不断调整，所以我们不保证下述内容能及时跟进社区变化。了解最新准确的功能对比，可查看 Elasticsearch 官方介绍 [Elastic Stack 订阅](#)。

下表中)、)、)用于表示对应特性的功能完整度，)：包含全部功能；)：包含部分功能；)：不包含。

模块	特性	开源版	基础版	白金版

Elasticsearch	可扩展性和弹性			
	查询和分析			
	数据扩充			
	管理和工具			
	Security			
	机器学习			
Kibana	探索和可视化			
	堆栈管理和工具			
	堆栈监测			
	分享与合作			
	Security			
	机器学习			

Beats	数据收集			
	数据传输			
	模块			
	监测和管理			
Logstash	数据收集			
	数据扩充			
	数据传输			
	模块			
	监测和管理			
ELASTIC APM	APM 服务器			
	APM 代理			
	Kibana 中的 APM 仪表板			

	APM UI			
	分布式跟踪			
	Machine Learning 整合			
ELASTIC 日志	日志采集器 (Filebeat)			
	常用数据源的仪表板			
	Logs UI			
ELASTIC 基础设施	指标采集器 (Metricbeat)			
	常用数据源的仪表板			
	Infrastructure UI			
ELASTIC 运行状态监控	运行状态监测 (Heartbeat)			
	Kibana 里的运行状态仪表板			
	运行状态监测 UI			

Elasticsearch 部分功能详细说明：

下表中 ✓ 用于表示是否拥有对应特性的功能，√：表示具备；-：表示不具备。

Elasticsearch功能模块	细项	开源版	基础版	白金版
管理和工具	REST API	✓	✓	✓
	语言客户端	✓	✓	✓
	快照/恢复	✓	✓	✓
	_仅源快照	-	✓	✓
	SQL 解释器 CLI	-	✓	✓
	数据汇总	-	✓	✓
	索引生命周期管理	-	✓	✓
	冻结索引	-	✓	✓
	升级助手 API	-	✓	✓
	JDBC 客户端	-	-	✓
	ODBC 客户端	-	-	✓
Security	加密通信	-	✓	✓
	基于角色的访问控制	-	✓	✓
	文件和原生身份验证	-	✓	✓
	审核日志	-	-	✓
	基于属性的权限控制	-	-	✓
	字段和文档级别安全性	-	-	✓
机器学习	时序型异常监测	-	-	✓
	输入/实体分析	-	-	✓
	日志消息分类	-	-	✓
	根本原因指示	-	-	✓

	异常情况警报	-	-	✓
	时序型预测	-	-	✓

产品优势

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腾讯云 ES 提供了云端托管的服务，您可容易地创建和管理 Elasticsearch 集群，并且能够保障生产环境中的高可用性。下文是对产品核心优势的介绍：

易于部署和管理

您只需通过简单的操作，即可在几分钟内创建一个 ES 集群，免去软硬件部署调试的复杂流程。此外，ES 还提供了便捷的集群运营管理工作、Kibana 页面以及完善的集群监控和告警系统，以满足客户日常的集群运营管理需求。

弹性扩缩容

ES 提供了多种类型的节点规格和存储介质，您可以根据业务需要进行选择。随着业务的发展，您可以动态调整集群的配置扩容或缩容，实时保障业务的发展需要并有效控制成本。

Elasticsearch 高级特性（X-Pack）

集成 Security、SQL、Machine Learning 等 Elasticsearch 高级特性（X-Pack），提升了 Elasticsearch 集群的安全管控、操作使用和运维管理效率。

高可用

ES 提供了多可用区部署方案，可保证在单可用区网络、电力等不可抗力故障下不停服。COS 数据备份策略可以定时备份数据，保障数据在意外情况下丢失时快速恢复。此外还有为保障集群稳定而进行的内核优化等策略，可以全方位地保障数据的安全和服务的稳定。

安全加固

通过部署在逻辑隔离的私有网络 VPC，客户可以完全掌控自己的环境配置，自定义网络访问控制列表（Access Control List）和安全组，提供了 Kibana 访问和 IP 访问黑白名单机制，高级特性（X-Pack）的 Security 能力提供了字段级的权限控制，切实保证您云上资源的安全性。

开放与服务集成

支持完整的 ELK 产品体系，兼容标准的开源 RESTful API 和生态组件，可以与对象存储 COS、网络流日志、消息队列、云数据库 TencentDB 等腾讯云产品集成，为用户提供数据传输和备份能力，以满足不同业务场景需要。

应用场景

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日志分析

网站服务器、移动设备、IOT 传感器等设备产生的日志都存在节点分散、种类多样、规模庞大等问题，这对需要通过日志搜索进行异常问题定位和业务分析等工作造成了很大的挑战。ES 提供了弹性可扩展、实时的集中式存储方案以及全文搜索功能，方便日志的统一管理和查询，帮助用户快速定位和发现问题，提高解决问题的效率。

全文检索

电商商品搜索、移动应用搜索、企业内部信息搜索等海量数据下的站内搜索服务是高效获取信息的必要途径，ES 拥有全文检索功能，对结构化和非结构化数据都有良好的支持，同时还提供了简单易用的 RESTful API 和各种语言的客户端，方便用户快速搭建稳定的搜索服务，整合到已有的业务框架中。

商业智能 BI

在数据驱动运营的行业背景下，电子商务、移动应用、广告媒体等业务都需要借助数据分析和数据挖掘来辅助商业决策，而规模庞大的业务数据对数据的统计分析造成了很大的挑战。ES 拥有结构化查询的能力，支持复杂的过滤和聚合统计功能，帮助客户对海量数据进行高效地个性化统计分析、发现问题与机会、辅助商业决策，让数据产生真正的价值。

能力与限制说明

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腾讯云 ES 是基于开源软件 Elasticsearch 开发的云上 PaaS 服务。通过腾讯云 ES 您可以快速搭建 Elasticsearch 集群服务，开发日志分析、数据搜索等应用。下面介绍产品能力和使用限制。

产品构成

腾讯云 ES 包含核心部件 Elasticsearch 集群和数据可视化分析工具 Kibana 两部分。数据采集和传输到 ES 集群的部分，您可以根据自己的业务需要，部署数据采集工具如 Beats、Logstash 或开发应用程序，将数据写入 ES 集群。

可选配置

节点规格

参数名称	CPU 核数	内存
ES.S1.SMALL2	1	2G
ES.S1.MEDIUM4	2	4G
ES.S1.MEDIUM8	2	8G
ES.S1.LARGE16	4	16G
ES.S1.2XLARGE32	8	32G
ES.S1.4XLARGE32	16	32G
ES.S1.4XLARGE64	16	64G

其中1核2G仅为测试用，不建议用于生产环境。

存储

SSD 云盘，单个节点，磁盘大小限制为100GB - 6TB。

节点个数

节点个数限制为2 - 50。由于 ES 集群常以分布式多节点的形式构成，因此需要有主节点对集群进行统一的管理。为了防止可能的节点故障导致脑裂问题，建议您至少选择3个节点构建集群。

配置选择

可参考最佳实践文档的 [集群规格和容量配置评估](#)。

网络访问

VPC 内网访问

为了保证数据的安全，腾讯云 ES 构建在用户 VPC 内，也只能通过 VPC 访问集群进行数据的写入和查询。如果您需要通过公网访问 ES 集群，进行开发调试，可以通过 [VPN连接](#) 的方式，打通本地 IDC 和云上 VPC。同时也提醒您做好数据安全防护。

Kibana 页面

支持通过公网访问 Kibana 页面，为了保证数据安全，Kibana 页面需要设置密码和访问 IP 黑白名单。

VPC 网络选择

腾讯云 ES 创建完成后，不支持切换 VPC 网络，请在创建集群时，提前规划业务部署。

相关概念

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Elasticsearch 集群一般是由多个节点共同组成的分布式集群，节点之间互通，彼此配合，共同对外提供搜索和索引服务（节点之间能够将客户端请求转向到合适的节点）。不同的节点会负责不同的角色，有的负责一个，有的可能负责多个。Elasticsearch 中有多个节点角色，其中有两个比较主要的是数据节点和主节点。

数据节点（Data Node）

主要承担了数据存储和数据处理的工作，保存索引分片，处理与数据相关的操作，例如 CRUD、搜索、聚合等各种 I/O、内存和 CPU 密集型操作。集群使用过程中，需要注意监控数据节点的资源使用率，并在服务过载时通过添加更多的数据节点，进行集群扩容，以保障集群的稳定性。

主节点（Master Node）

负责轻量化整个集群范围内的操作，例如创建或删除索引、跟踪哪些节点是集群的一部分以及决定将哪些分片分配给哪些节点。对于集群健康来说，拥有一个稳定的主节点非常重要。

备选主节点（Master-eligible node）

指有资格被选为主节点的节点，任何符合主节点条件的节点（默认情况下为所有节点）都可以通过主选择过程被选为主节点。

默认情况下，所有节点都是数据节点，也都是备选主节点，这对于小型集群来说非常方便。由于数据节点处理索引和搜索数据的请求都是 I/O、内存和 CPU 密集型工作，可能对节点的资源造成压力。随着集群的增长，为了确保主节点稳定且不受压力，保障集群的稳定，需将主节点和数据节点分离。

专用主节点（Dedicated Master Node）

指 Elasticsearch 集群中，设置了只能作为主节点的节点。

专用主节点配置建议

设置专用主节点主要是为保障集群增大时的稳定性，建议专用主节点个数至少为3个。

- 专用主节点个数为1：只有1个备选主节点，`discovery.zen.minimum_master_nodes` 设置为1，网络发生故障时缺少备份。
- 专用主节点个数为2：有2个备选主节点，`minimum_master_nodes` 设置为1，有备份节点，但网络发生故障，在重新选主时，有发生脑裂的风险（每个备选主节点都将自己设置为主节点）；`minimum_master_nodes` 设置为2，发生故障时，可选主节点个数达不到要求，不能选出主节点。
- 专用主节点个数为3：有3个备选主节点，`discovery.zen.minimum_master_nodes` 设置为2，网络发生故障时，丢失一个可选主节点，在重新选主时，能有效选出主节点。

其他详细说明，可参考 [ES 节点说明](#)。