云搜索服务

产品介绍

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漏洞处理流程

华为公司对产品漏洞管理的规定以“漏洞处理流程”为准，该流程的详细内容请参见如下网址：
https://www.huawei.com/cn/psirt/vul-response-process
如企业客户须获取漏洞信息，请参见如下网址：
https://securitybulletin.huawei.com/enterprise/cn/security-advisory

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什么是云搜索服务

云搜索服务（Cloud Search Service，简称CSS）是一个基于Elasticsearch且完全托管的在线分布式搜索服务，为用户提供结构化、非结构化文本、以及基于AI向量的多条件检索、统计、报表。云搜索服务是华为云ELK生态的一系列软件集合，为您全方位提供托管的ELK生态云服务，兼容Elasticsearch、Kibana、Cerebro等软件。

Elasticsearch是一个搜索引擎，可以实现单机和集群部署，并提供托管的分布式搜索引擎服务。在ELK整个生态中，Elasticsearch集群支持结构化、非结构化文本的多条件检索、统计、报表。Elasticsearch搜索引擎相关内容的深入介绍可参见**《Elasticsearch：权威指南》**。

云搜索服务支持自动部署，快速创建Elasticsearch集群，免运维，内置搜索调优实践；拥有完善的监控体系，提供一系列系统、集群以及查询性能等关键指标，让用户更专注于业务逻辑的实现。

产品功能

- 兼容Elasticsearch原生接口

  兼容开源Elasticsearch软件原生接口，完美支持Beats、Kibana等周边生态。
- 接入多种数据源

  无缝对接Ftp/Obs/Hbase/Kafka等多种数据源，仅需简单配置，无需编程。
- 一键化操作

  一键申请集群、一键扩容、一键重启，从小规模测试到大规模上线，所有主要操作都是一键可达。
- 灵活词库管理

  支持自定义词库与拼音分词，支持词库热更新，无需重启，配置即生效。
- 自定义快照策略

  支持用户触发以及定时触发的快照备份能力，支持恢复到本集群以及其他集群的能力，随时恢复误删数据或者迁移数据到新的搜索集群。

访问方式

公有云提供了Web化的服务管理平台，即管理控制台和基于HTTPS请求的API（Application programming interface）管理方式。

- API方式

  如果用户需要将公有云平台上的云搜索服务集成到第三方系统，用于二次开发，请使用API方式访问云搜索服务，具体操作请参见**《云搜索服务API参考》**。

- 控制台方式

  其他相关操作，请使用管理控制台方式访问云搜索服务。如果用户已注册公有云，可直接登录管理控制台，在服务列表搜索“云搜索服务”。如果未注册，请单击右上方“注册”，根据界面提示填写用户基本信息，然后单击“同意协议并注册”完成管理控制台用户注册。

3 产品优势

云搜索服务主要有以下特点与显著优势：

高效易用

TB级数据毫秒级返回检索结果，提供可视化平台方便数据展示和分析。

弹性灵活

按需申请，在线扩容，零业务中断，快速应对业务增长。

无忧运维

全托管服务，开箱即用，主要操作一键可达，专业团队贴身看护。

内核增强

- **向量检索**

  云搜索服务的向量检索引擎支持对图像、视频、语料等非结构化数据提取的特征向量数据进行最近邻或近似近邻检索。详情请参见**向量检索**。

- **存算分离**

  云搜索服务提供冻结索引API，支持将存储在SSD的热数据转储到OBS中以降低数据的存储成本，实现存算分离。详情请参见**存算分离**。

- **流量控制**

  云搜索服务支持流量控制，提供节点级别的流量控制功能，可提供单个节点基于黑白名单的访问限制、HTTPS并发连接数限制、HTTP最大连接数限制等。每个功能配置独立的控制开关。详情请参见**流量控制**。

- **大查询隔离**

  云搜索服务的大查询隔离特性支持对查询请求进行独立管理，将高内存、长耗时的查询请求进行隔离，保证节点内存安全。详情请参见**大查询隔离**。

- **索引监控**

  云搜索服务的索引监控特性提供了丰富的监控指标，用以监控集群索引的运行状况和变化趋势，衡量业务使用情况，同时可以针对可能存在的风险及时处理，保障集群的稳定运行。详情请参见**索引监控**。

- **集群监控增强**

云搜索服务支持集群监控增强，支持对集群Search请求的P99时延进行监控、对集群HTTP状态码进行监控等。详情请参见**集群监控增强**。

高可靠性

支持用户手动触发以及定时触发的快照备份，支持恢复到本集群以及其他集群的能力，通过快照恢复支持集群的数据迁移。详情请参见**备份与恢复**。

- 自动备份（备份快照）

  云搜索服务提供备份功能，可以在控制台的备份恢复界面开启自动备份功能，并根据实际业务需要设置备份周期。

  自动备份是将集群的索引数据进行备份。索引的备份是通过创建集群快照实现，第一次备份时，建议将所有索引数据进行备份。

  云搜索服务支持将ES实例的快照数据保存到对象存储（OBS）服务中，借助OBS的跨region复制功能，可实现数据的跨region备份。

- 恢复数据（恢复快照）

  当数据发生丢失或者想找回某一时间段数据时，可以在“集群快照”界面上单击“恢复”功能，将已有的快照，通过恢复快照功能，将备份的索引数据恢复到指定的集群中，可以快速获得数据。

高安全性

云搜索服务主要从以下几个方面保障数据和业务运行安全：

- 网络隔离

  整个网络划分为2个平面，即业务平面和管理平面。两个平面采用物理隔离的方式进行部署，保证业务、管理各自网络的安全性。

  - 业务平面：主要是集群的网络平面，支持为用户提供业务通道，对外提供数据定义、索引、搜索能力。
  - 管理平面：主要是管理控制台，用于管理云搜索服务。
  - 通过VPC或安全组专有网络来确保主机的安全。

- 访问控制
  - 通过网络访问控制列表（ACL），可以允许或拒绝进入和退出各个子网的网络流量。
  - 内部安全基础设施（包括网络防火墙、入侵检测和防护系统）可以监视通过IPsec VPN连接进入或退出VPC的所有网络流量。
  - 支持用户认证与索引级别鉴权，支持对接第三方管理用户系统。

- 数据安全
  - 在云搜索服务中，通过多副本机制保证用户的数据安全。
  - 支持客户端与服务端通过SSL加密通信。

- 操作审计

  通过云审计服务支持对关键日志与操作进行审计。

高可用性

云搜索服务支持跨可用区部署方案。为了防止数据丢失并在服务中断时最大限度地减少集群停机时间，在创建集群时，可以选择部署在同一个区域中的两个或三个可用区，系统将在选择的可用区之间自动分配节点。当某一可用区出现故障时，剩余的可

用区依然可以不间断地提供服务，显著增强了集群的可用性，提升了服务的稳定性。更多信息请参见**部署跨AZ集群**。

4 产品组件

CSS服务支持Kibana和Cerebro组件。

Kibana

Kibana是一个开源的数据分析与可视化平台，与Elasticsearch搜索引擎一起使用。通过Kibana可以搜索、查看存放在Elasticsearch索引中的数据，也可以实现以图表、地图等方式展示数据。Kibana的官方文档请参见：**https://www.elastic.co/guide/en/kibana/current/index.html**

云搜索服务的Elasticsearch集群默认提供Kibana，无需安装部署，即可一键访问Kibana。云搜索服务兼容了开源Kibana可视化展现和Elasticsearch统计分析能力。

- 支持10余种数据呈现方式
- 支持近20种数据统计方式
- 支持时间、标签等各种维度分类

Cerebro

Cerebro是使用Scala、Play Framework、AngularJS和Bootstrap构建的基于Elasticsearch Web的开源可视化管理工具。通过Cerebro可以对集群进行Web可视化管理，如执行Rest请求、修改Elasticsearch配置、监控实时的磁盘、集群负载、内存使用率等。

云搜索服务的Elasticsearch集群默认提供Cerebro，无需安装部署，即可一键访问Cerebro。云搜索服务完全兼容开源Cerebro，适配最新0.8.4版本。

- 支持Elasticsearch可视化实时负载监控。
- 支持Elasticsearch可视化数据管理。

5 应用场景

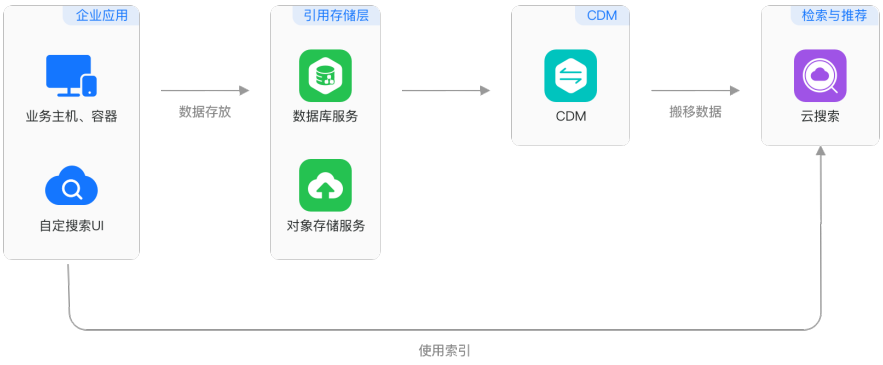
云搜索服务可以帮助网站和APP搭建搜索框，提升用户的搜索体验；也可以用于搭建日志分析平台，助力企业实现数据驱动运维，数据驱动运营；它的向量检索能力可以帮助客户快速构建基于AI的图搜、推荐、语义搜索等丰富的应用。

站内搜索

云搜索服务可用于对网站内容进行关键字检索、对电商网站商品进行检索与推荐。

- 实时检索：站内资料或商品信息更新数秒至数分钟内即可被检索。
- 分类统计：检索同时可以将符合条件的商品进行分类统计。
- 高亮提示：提供高亮能力，页面可自定义高亮显示方式。

图 5-1 站内搜索场景



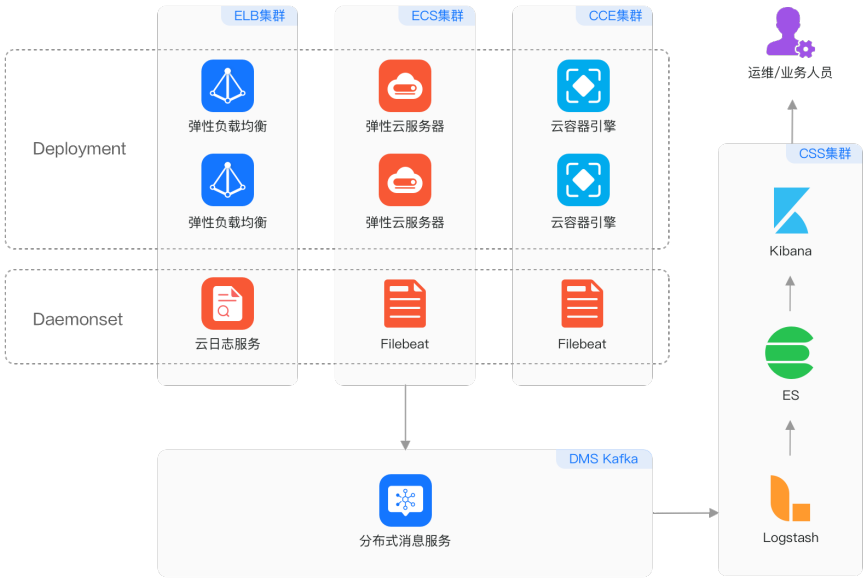
全场景日志分析

云搜索服务可用于全场景日志分析，包括ELB日志、服务器日志、容器和应用日志。其中Kafka作为消息缓冲队列，用于削峰填谷，Logstash负责数据ETL，Elasticsearch负责数据检索与分析，最后由Kibana以可视化的方式呈现给用户。

- 性价比高：采用鲲鹏算力、冷热分离、存算分离，成本同比降低30%+。

- 易用性好：支持丰富的可视化查询语句与拖拽式报表。
- 强大的处理能力：支持每天百TB级数量入库，提供PB级以上数据处理能力。

图 5-2 全场景日志分析场景

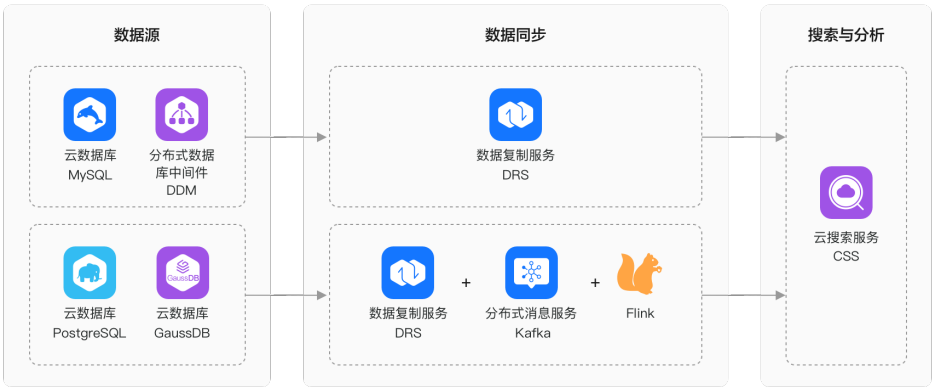


数据库查询加速

云搜索服务可用于加速数据库查询。在电商、物流企业等有订单查询的业务场景，存在数据量大、查询并发高、吞吐大、查询延迟低的要求，关系型数据库具备较好的事务性与原子性，但其TP与AP处理能力较弱，通过将CSS作为备数据库，可提升整个系统的TP与AP处理能力。

- 高性能：支持文本、时间、数字、空间等数据类型；亿级数据查询毫秒级响应。
- 高可扩展性：支持200+数据节点，支持1000+个数据字段。
- 业务“0”中断：规格变更、配置更新采用滚动重启，双副本场景下业务0中断。

图 5-3 数据库查询加速场景

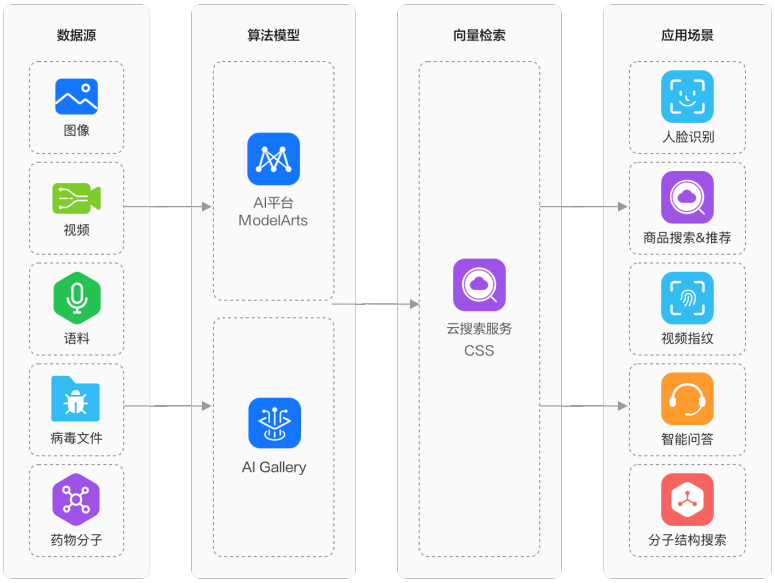


向量检索

云搜索服务支持对图像、视频、语料等非结构化数据提取的特征向量数据进行最近邻或近似近邻检索。

- 高效可靠：华为云向量检索引擎，提供极致的搜索性能以及分布式容灾能力。
- 索引丰富：支持多种索引算法及相似度度量方式，满足各类应用场景及需求。
- “0”学习成本：完全兼容开源ES语法与生态。

图 5-4 向量检索场景



6 计费说明

云搜索服务的计费方式简单、灵活，您既可以选择按实际使用的资源计费，也可以选择更经济的按包周期（包年包月）计费方式。详细的费用价格请参见**CSS价格计算器**。

计费项

云搜索服务对您选择的实例规格和使用时长计费。

表 6-1 云搜索服务计费说明

计费项	计费说明
节点规格	节点类型及规格（vCPUs、内存），购买时长以及所购买的实例数量，提供按需计费和包年包月2种计费方式。
节点存储	磁盘类型。您可以根据具体的业务场景选择对应的磁盘类型，不同的磁盘类型收费标准不一样。 节点存储提供按需计费和包年包月2种计费方式。 云搜索服务提供了多种磁盘类型： • 普通I/O • 高I/O • 超高I/O
带宽	带宽大小。当您对集群开通公网访问或者Kibana公网访问功能时，会产生带宽计费。 带宽提供按需计费和包年包月2种计费方式。 云搜索服务提供了两种带宽类型： • 低带宽(1~5Mbit/s) • 高带宽(6~2000Mbit/s) 根据您选择的带宽大小，计费时会自动归类到低带宽或者高带宽。

计费模式

- 按需计费

  按需计费方式，即按实际使用时长计费，以小时为单位计费，不足一小时按一小时计费。这种购买方式比较灵活，可以即开即停。适用于资源需求波动的场景，可以随时开通，随时删除。

- 包年包月计费

  包年包月计费方式按照订单的购买周期来进行结算。选择购买时长后，一次性支付费用。最短时长为1个月，最长时长为3年。这种购买方式相对于按需付费则能够提供更大的折扣，对于长期使用者，推荐该方式。

变更配置

- 更改计费模式

  按需变更为包年包月：会生成新的订单，用户支付订单后，包年包月资源立即生效。

  包年包月变更为按需：包年包月转按需，需要包年包月资费模式到期后，按需的资费模式才会生效。

- 变更节点存储和节点数量

  如果原集群是按需计费方式，则扩缩容集群变更的节点数量和节点存储容量默认是按需计费方式。

  如果集群是包年包月计费方式，扩缩容集群变更的节点数量和节点存储容量，会根据当前变更时间到创建集群时的购买周期的截止日期计费。例如，创建集群时购买的包周期为1个月，到期时间为1月30日，在包周期到期之前进行变更，假设变更日期为1月20日，则用户需要支付1月20日到1月30日之间所变更的资源费用。

- 变更节点规格

  当集群更改节点规格后，则按照新的节点规格进行计费。

- 变更带宽

  如果更改了集群公网访问或者Kibana公网访问中的带宽，则按照新的带宽进行计费。

续费

资源包到期后，您可以进行续费以延长资源包的有效期，也可以设置到期自动续费。续费相关操作，请参见**续费管理**。

到期与欠费

到期欠费后，可以查看欠费详情。为防止相关资源被停止或者释放，请及时进行充值。账号将进入欠费状态，需要在约定时间内支付欠款，详细操作请参考**欠费还款**。

7 安全

7.1 责任共担

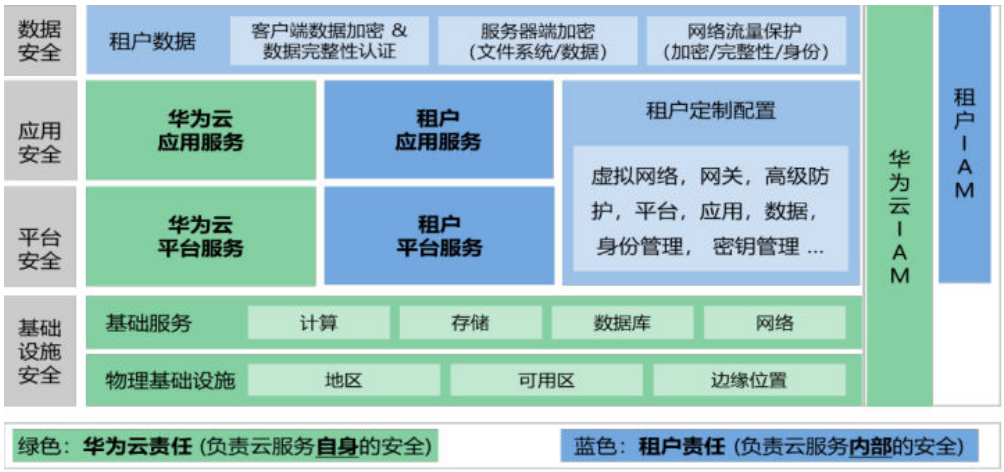
华为云秉承“将公司对网络和业务安全性保障的责任置于公司的商业利益之上”。针对层出不穷的云安全挑战和无孔不入的云安全威胁与攻击，华为云在遵从法律法规业界标准的基础上，以安全生态圈为护城河，依托华为独有的软硬件优势，构建面向不同区域和行业的完善云服务安全保障体系。

安全性是华为云与您的共同责任，如**图7-1**所示。

- 华为云：负责云服务自身的安全，提供安全的云。华为云的安全责任在于保障其所提供的 IaaS、PaaS 和 SaaS 各类各项云服务自身的安全，涵盖华为云数据中心的物理环境设施和运行其上的基础服务、平台服务、应用服务等。这不仅包括华为云基础设施和各项云服务技术的安全功能和性能本身，也包括运维运营安全，以及更广义的安全合规遵从。
- 租户：负责云服务内部的安全，安全地使用云。 华为云租户的安全责任在于对使用的 IaaS、PaaS 和 SaaS 类各项云服务内部的安全以及对租户定制配置进行安全有效的管理，包括但不限于虚拟网络、虚拟主机和访客虚拟机的操作系统，虚拟防火墙、API 网关和高级安全服务，各项云服务，租户数据，以及身份账号和密钥管理等方面的安全配置。

《华为云安全白皮书》详细介绍华为云安全性的构建思路与措施，包括云安全战略、责任共担模型、合规与隐私、安全组织与人员、基础设施安全、租户服务与租户安全、工程安全、运维运营安全、生态安全。

图 7-1 华为云安全责任共担模型



7.2 身份认证与访问控制

CSS服务的身份认证和访问控制主要包括两个大的方面：一方面是通过统一身份认证服务（Identity and Access Management，简称IAM）实现服务资源层面的身份认证和访问控制；另一方面是由CSS服务提供的安全集群内的身份认证和访问控制实现。两者是相互独立的模块。

IAM服务主要用来控制CSS服务管理面的资源操作权限。使用CSS服务时，如果需要给企业中的员工设置不同的控制台访问权限，以达到不同员工之间的权限隔离，可以使用IAM进行精细的权限管理。IAM提供用户身份认证、权限分配、访问控制等功能，可以安全控制CSS服务相关资源的访问。CSS权限管理请参见**权限管理**。

CSS集群内部的权限控制是通过安全集群实现的，当集群开启安全模式后，访问集群时需要进行身份认证，通过Kibana可以给集群创建用户进行授权。详细信息请参见**安全集群简介**。CSS服务仅支持对安全模式的集群进行身份认证与访问控制。

7.3 数据保护技术

云搜索服务主要从以下几个方面保障数据和业务运行安全：

- 网络隔离

  整个网络划分为2个平面，即业务平面和管理平面。两个平面采用物理隔离的方式进行部署，保证业务、管理各自网络的安全性。
  - 业务平面：主要是集群的网络平面，支持为用户提供业务通道，对外提供数据定义、索引、搜索能力。
  - 管理平面：主要是管理控制台，用于管理云搜索服务。
- 主机安全

  云搜索服务提供如下安全措施：
  - 通过VPC安全组来确保VPC内主机的安全。
  - 通过网络访问控制列表（ACL），可以允许或拒绝进入和退出各个子网的网络流量。
  - 内部安全基础设施（包括网络防火墙、入侵检测和防护系统）可以监视通过IPsec VPN连接进入或退出VPC的所有网络流量。

- 数据安全
  在云搜索服务中，通过多副本、集群跨az部署、索引数据第三方（OBS）备份功能保证用户的数据安全。

7.4 审计与日志

审计

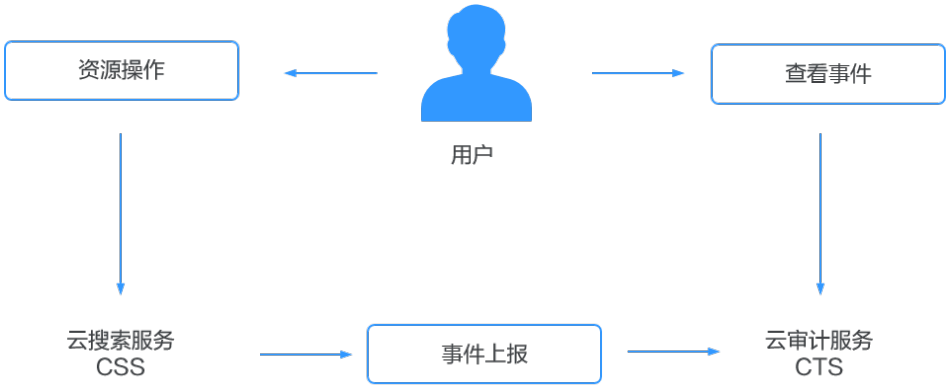
云审计服务（Cloud Trace Service，CTS），是华为云安全解决方案中专业的日志审计服务，提供对各种云资源操作记录的收集、存储和查询功能，可用于支撑安全分析、合规审计、资源跟踪和问题定位等常见应用场景。

用户开通云审计服务并创建和配置追踪器后，CTS可记录CSS服务的操作事件用于审计。

CTS的详细介绍和开通配置方法，请参见**CTS快速入门**。

CSS服务支持云审计的操作列表请参见**支持云审计的关键操作**。

图 7-2 云审计服务



在您开启了云审计服务后，系统会记录云搜索服务的相关操作，且控制台保存最近7天的操作记录。如何在云审计服务管理控制台查看最近7天的CSS服务操作记录请参见**查看审计日志**。

日志

除了云审计日志，CSS服务自身也有日志功能。为了方便用户使用日志定位问题，云搜索服务提供了日志备份和日志查询功能。用户可以将集群的日志备份在OBS桶中，通过OBS可以直接下载需要的日志文件进行问题分析定位。CSS服务的日志管理请参见**日志管理**。

7.5 监控安全风险

云监控（Cloud Eye）是面向华为云资源的监控平台，提供了实时监控、及时告警、资源分组、站点监控等能力。CSS服务基于云监控服务CES，从集群和节点两个维度提供了丰富的监控指标，监控信息通过CES对外提供可视化报表展示。

CSS支持的监控指标请参见**支持的监控指标**。基于CES的告警能力，可以对指定的监控指标进行阈值告警，如何配置集群的监控告警请参见**配置集群监控**。

7.6 安全公告

7.6.1 云搜索服务关于 Apache log4j 远程代码执行漏洞（CVE-2021-44228）的公告

华为云关注到Apache Log4j2存在一处远程代码执行漏洞（CVE-2021-44228），本公告为您介绍该漏洞的影响及修复方案。

漏洞影响

在引入Apache Log4j2处理日志时，漏洞（CVE-2021-44228）会对用户输入的内容进行一些特殊的处理，攻击者可以构造特殊的请求，触发远程代码执行。目前POC已公开，风险较高。详细请参见**Apache Log4j2 远程代码执行漏洞（CVE-2021-44228、CVE-2021-45046）**。

Elasticseach使用Log4j框架记录日志，同时Elasticsearch使用了Java安全管理器不易受到远程代码执行漏洞的影响。Log4j中的信息泄露漏洞使攻击者能够通过DNS泄露某些环境数据，但是此漏洞不允许访问Elasticsearch集群内的数据，因此通过Log4j漏洞只能查找到环境变量和其他一些有限的环境数据，无需担心数据泄露。

漏洞修复

云搜索服务针对此漏洞已经对现网集群进行了补丁升级，请留意集群使用情况。如果在2022年3月30日以后未对集群进行过重启，请及时重启集群使补丁生效。

8 权限管理

在使用云搜索服务（Cloud Search Service）的过程中，如果需要给企业中的员工设置不同的访问权限，以达到不同员工之间的权限隔离，您可以使用统一身份认证服务（Identity and Access Management，简称IAM）进行精细的权限管理。该服务提供用户身份认证、权限分配、访问控制等功能，可以帮助您安全控制云服务资源的访问。

如果当前账号已经能满足您的需求，不需要创建独立的IAM用户进行权限管理，您可以跳过本章节，不影响您使用CSS服务的其它功能。

通过IAM，您可以在账号中给员工创建IAM用户，并授权控制他们对资源的访问范围，而且无需付费即可使用，您只需要为使用中的资源进行付费。关于IAM的详细介绍，请参见**《IAM产品介绍》**。

CSS 权限

默认情况下，CSS服务管理员创建的IAM用户没有任何权限，需要将其加入用户组，并给用户组授予策略或角色，才能使得用户组中的用户获得对应的权限，这一过程称为**授权**。授权后，用户就可以基于被授予的权限对云服务进行操作。

CSS是项目级服务，部署时通过物理区域划分，需要在各区域（如华北-北京1）对应的项目（cn-north-1）中设置策略，并且该策略仅对此项目生效，如果需要所有区域都生效，则需要在所有项目都设置策略。访问CSS时，需要先切换至授权区域。

根据授权精细程度分为角色和策略。

- 角色：IAM最初提供的一种根据用户的工作职能定义权限的粗粒度授权机制。该机制以服务为粒度，提供有限的服务相关角色用于授权。由于各服务之间存在业务依赖关系，因此给用户授予角色时，可能需要一并授予依赖的其他角色，才能正确完成业务。角色并不能满足用户对精细化授权的要求，无法完全达到企业对权限最小化的安全管控要求。
- 策略：IAM最新提供的一种细粒度授权的能力，可以精确到具体服务的操作、资源以及请求条件等。基于策略的授权是一种更加灵活的授权方式，能够满足企业对权限最小化的安全管控要求。例如：CSS服务管理员能够控制IAM用户仅能对某一类云服务器资源进行指定的管理操作。多数细粒度策略以API接口为粒度进行权限拆分，CSS服务支持的API授权项请参见**权限策略和授权项**。

如**表8-1**所示，包括了CSS的所有系统权限。

- 对于CSS Administrator，由于各服务之间存在业务交互关系，CSS的角色依赖其他服务的角色实现功能。因此给用户授予CSS的角色时，需要同时授予依赖的角色，CSS的权限才能生效。
- 对于CSS FullAccess和CSS ReadOnlyAccess，可使用这些策略来控制对云服务资源的访问范围。例如，您的员工中有负责软件开发的人员，您希望他们拥有CSS的使用权限，但是不希望他们拥有删除CSS等高危操作的权限，那么您可以使用IAM为开发人员创建IAM用户，通过授予仅能使用CSS但不允许删除CSS的权限，控制他们对CSS资源的使用范围。

表 8-1 CSS 系统权限

系统角色/策略名称	类别	权限描述	依赖关系
CSS Administrator	系统角色	CSS服务的所有执行权限。 该角色有依赖，需要在同项目中勾选依赖的Tenant Guest、Server Administrator和IAM ReadOnlyAccess角色。	终端节点访问集群操作需要依赖VPCEndpoint Administrator系统角色。 部分操作依赖如下授权项： • 查看委托列表 iam:agencies:listAgencies iam:permissions:listRolesForAgency iam:permissions:listRolesForAgencyOnProject • 自动创建委托 iam:agencies:listAgencies iam:agencies:createAgency iam:permissions:grantRoleToAgency • 控制台显示企业项目和预定义标签 eps:enterpriseProjects:list tms:predefineTags:list • 快照、词库、日志管理功能使用 obs:bucket:Get* obs:bucket:List* obs:object:List* obs:object:Get* obs:bucket:HeadBucket obs:object:PutObject obs:object:DeleteObject • 包年/包月订单创建及支付 bss:order:update bss:order:pay 更多与订单相关操作所需要的授权项请见**费用中心细粒度策略**。
CSS FullAccess	系统策略	基于策略授权的CSS服务的所有权限，拥有该权限的用户可以完成基于策略授权的CSS服务的所有执行权限。 该策略部分权限有依赖，如果要使用对应的功能，需要在同项目中勾选依赖的权限。	

系统角色/策略名称	类别	权限描述	依赖关系
CSS ReadOnlyAccess	系统策略	CSS服务的只读权限，拥有该权限的用户仅能查看CSS服务数据。 该策略部分权限有依赖，如果要使用对应的功能，需要在全局服务中勾选依赖的权限。	部分操作依赖如下授权项： • 查看委托列表 iam:agencies:listAgencies iam:permissions:listRolesForAgency iam:permissions:listRolesForAgencyOnProject • 控制台显示企业项目和预定义标签 eps:enterpriseProjects:list tms:predefineTags:list • 快照、词库、日志管理功能使用 obs:bucket:Get* obs:bucket:List* obs:object:List* obs:object:Get* obs:bucket:HeadBucket

如表8-2所示列出了CSS常用操作与系统权限的授权关系，您可以参照该表选择合适的系统权限。

表 8-2 常用操作与系统权限的关系

操作	CSS FullAccess	CSS ReadOnlyAccess	CSS Administrator	备注
创建集群	√	x	√	-
查询集群列表	√	√	√	-
查询集群详情	√	√	√	-
删除集群	√	x	√	-
重启集群	√	x	√	-
扩容集群	√	x	√	-

操作	CSS FullAccess	CSS ReadOnlyAccess	CSS Administrator	备注
扩容实例的数量和存储容量	√	x	√	-
查询指定集群的标签	√	√	√	-
查询所有标签	√	√	√	-
加载自定义词库	√	x	√	依赖OBS和IAM权限
查询自定义词库状态	√	√	√	-
删除自定义词库	√	x	√	-
自动设置集群快照的基础配置	√	x	√	依赖OBS和IAM权限
修改集群快照的基础配置	√	x	√	依赖OBS和IAM权限
设置自动创建快照策略	√	x	√	-
查询集群的自动创建快照策略	√	√	√	-
手动创建快照	√	x	√	-
查询快照列表	√	√	√	-
恢复快照	√	x	√	-
删除快照	√	x	√	-
停用快照功能	√	x	√	-
更改规格	√	x	√	-
缩容集群	√	x	√	-

相关链接

- IAM产品介绍
- 创建用户并授予权限
- 策略支持的授权项

9 产品规格

当您在云搜索服务创建集群时，系统将为您提供多种规格以满足您按需选择的要求。具体规格说明和适用场景请见**表9-1**。

表 9-1 节点规格

CPU架构	节点规格类型	CPU内存比	适合场景
X86计算	计算密集型	1:2	CPU较强，适合高计算、要求低时延的搜索场景，比如电商，APP搜索，配合超高IO的磁盘。成本较高，相对于NVMe的本地盘集群可靠性强。
	磁盘增强型	1:8	磁盘较大，本地SAS直通盘。适合存储大量数据的日志、舆情场景等场景。一般冷节点优选这种规格。
	通用计算型	1:4	默认规格，使用较频繁，各种场景都能使用，如果没有特别要求，可选择该规格。
	内存优化型	1:8	内存较大，优势较明显，在内存使用量较多并且对时延没有太大要求的场景可优先选择该规格，比如多聚合（filedata堆内）、排序、列式存储格式DocValue（系统堆外内存）等场景。
	超高IO型	1:8	NVMe接口的本地SSD盘，相比磁盘增强型，数据盘较小。适合对时延要求高，写入压力大的场景，比如电商、APP搜索，性能比SSD云盘更好。存在本地盘有宕机的风险，需要开启副本。
鲲鹏计算	鲲鹏通用计算型	1:2 和1:4	同上X86计算型场景，相比于X86计算型，ARM性价比较高。
	鲲鹏超高IO型	1:4	性价比高，NVMe SSD本地盘，价格比超高IO型便宜，并且没有太大的内存浪费。适合低时延、写入高的场景，存在本地盘有宕机的风险，需要开启副本。

10 约束与限制

集群和节点限制

下表显示了云搜索服务的集群和节点的限制。

表 10-1 Elasticsearch 类型集群和节点限制

集群和节点	限制
每个集群的最大节点数（节点数量）	默认值32，最大支持200个节点，如果需要更改默认值，请联系技术支持。
每个集群的最小节点数（节点数量）	1

浏览器限制

- 访问云搜索服务管理控制台，建议使用如下版本浏览器
  - Google Chrome：36.0及更高版本
  - Mozilla FireFox：35.0及更高版本
  - Microsoft Edge：建议使用产品版本上线的最新3个稳定版本
- 访问云搜索服务中Kibana和Cerebro，建议使用如下版本浏览器
  - Google Chrome：36.0及更高版本
  - Mozilla FireFox：35.0及更高版本
  - Microsoft Edge：建议使用产品版本上线的最新3个稳定版本

11 性能说明

11.1 概述

通过Elasticsearch官方提供的benchmark脚本rally1.0.0，对云搜索服务的集群（版本：7.6.2）进行性能测试，测试结果如下所示。

本次测试采用官方提供的geonames，大小3.2G，11396505个doc。索引采用6个shard（默认为5个）。性能指标说明可以参考官方文档**https://esrally.readthedocs.io/en/stable/summary_report.html#summary-report**。

提供以下几种规格的CSS集群性能测试结果：

- **ess.spec-2u8g规格、3个节点数的集群性能测试**
- **ess.spec-4u16g规格、节点数为3的集群性能测试**

同时提供了节点规格为ess.spec-2u8g、节点数为3的集群，与节点规格为ess.spec-4u16g、节点数为3的集群性能测试结果对比，详情请见**ess.spec-2u8g规格与ess.spec-4u16g规格的集群性能测试对比**。

11.2 ess.spec-2u8g 规格、3 个节点数的集群性能测试

节点规格为ess.spec-2u8g、节点数为3的集群性能测试结果如下。

Metric	Task	Value	Unit
Cumulative indexing time of primary shards	-	11.48263333	min
Min cumulative indexing time across primary shards	-	0	min

Metric	Task	Value	Unit
Median cumulative indexing time across primary shards	-	2.313783333	min
Max cumulative indexing time across primary shards	-	2.401766667	min
Cumulative indexing throttle time of primary shards	-	0	min
Min cumulative indexing throttle time across primary shards	-	0	min
Median cumulative indexing throttle time across primary shards	-	0	min
Max cumulative indexing throttle time across primary shards	-	0	min
Cumulative merge time of primary shards	-	6.466066667	min
Cumulative merge count of primary shards	-	85	-
Min cumulative merge time across primary shards	-	0	min
Median cumulative merge time across primary shards	-	1.257475	min
Max cumulative merge time across primary shards	-	1.417283333	min

Metric	Task	Value	Unit
Cumulative merge throttle time of primary shards	-	1.089583333	min
Min cumulative merge throttle time across primary shards	-	0	min
Median cumulative merge throttle time across primary shards	-	0.200458333	min
Max cumulative merge throttle time across primary shards	-	0.28265	min
Cumulative refresh time of primary shards	-	3.641266667	min
Cumulative refresh count of primary shards	-	530	-
Min cumulative refresh time across primary shards	-	0	min
Median cumulative refresh time across primary shards	-	0.725791667	min
Max cumulative refresh time across primary shards	-	0.74775	min
Cumulative flush time of primary shards	-	0.3056	min
Cumulative flush count of primary shards	-	11	-
Min cumulative flush time across primary shards	-	0	min

Metric	Task	Value	Unit
Median cumulative flush time across primary shards	-	0.059858333	min
Max cumulative flush time across primary shards	-	0.09155	min
Total Young Gen GC	-	11.519	s
Total Old Gen GC	-	0	s
Store size	-	3.045436038	GB
Translog size	-	2.791873856	GB
Heap used for segments	-	15.81298065	MB
Heap used for doc values	-	0.037128448	MB
Heap used for terms	-	14.63806534	MB
Heap used for norms	-	0.073120117	MB
Heap used for points	-	0.272666931	MB
Heap used for stored fields	-	0.791999817	MB
Segment count	-	95	-
Min Throughput	index-append	41705.19	docs/s
Median Throughput	index-append	46911.27	docs/s
Max Throughput	index-append	47765.4	docs/s
50th percentile latency	index-append	642.339781	ms
90th percentile latency	index-append	1114.672936	ms
99th percentile latency	index-append	1733.648438	ms
99.9th percentile latency	index-append	4770.059011	ms

Metric	Task	Value	Unit
100th percentile latency	index-append	7045.246771	ms
50th percentile service time	index-append	642.339781	ms
90th percentile service time	index-append	1114.672936	ms
99th percentile service time	index-append	1733.648438	ms
99.9th percentile service time	index-append	4770.059011	ms
100th percentile service time	index-append	7045.246771	ms
error rate	index-append	0	%
Min Throughput	index-stats	90.05	ops/s
Median Throughput	index-stats	90.07	ops/s
Max Throughput	index-stats	90.12	ops/s
50th percentile latency	index-stats	2.834653556	ms
90th percentile latency	index-stats	3.527868712	ms
99th percentile latency	index-stats	4.332674769	ms
99.9th percentile latency	index-stats	8.392195267	ms
100th percentile latency	index-stats	9.692270112	ms
50th percentile service time	index-stats	2.766648	ms
90th percentile service time	index-stats	3.448194001	ms
99th percentile service time	index-stats	4.26309684	ms
99.9th percentile service time	index-stats	8.322068306	ms
100th percentile service time	index-stats	9.624071001	ms

Metric	Task	Value	Unit
error rate	index-stats	0	%
Min Throughput	node-stats	90.06	ops/s
Median Throughput	node-stats	90.1	ops/s
Max Throughput	node-stats	90.35	ops/s
50th percentile latency	node-stats	3.205233055	ms
90th percentile latency	node-stats	3.595145422	ms
99th percentile latency	node-stats	4.469114152	ms
99.9th percentile latency	node-stats	8.306063762	ms
100th percentile latency	node-stats	8.748160444	ms
50th percentile service time	node-stats	3.1379455	ms
90th percentile service time	node-stats	3.5278055	ms
99th percentile service time	node-stats	4.397312671	ms
99.9th percentile service time	node-stats	8.236949997	ms
100th percentile service time	node-stats	8.680502	ms
error rate	node-stats	0	%
Min Throughput	default	50.03	ops/s
Median Throughput	default	50.05	ops/s
Max Throughput	default	50.09	ops/s
50th percentile latency	default	2.354736001	ms
90th percentile latency	default	2.7983462	ms
99th percentile latency	default	4.59134772	ms

Metric	Task	Value	Unit
99.9th percentile latency	default	13.97301623	ms
100th percentile latency	default	16.199022	ms
50th percentile service time	default	2.286799	ms
90th percentile service time	default	2.7289099	ms
99th percentile service time	default	4.511846871	ms
99.9th percentile service time	default	13.90608139	ms
100th percentile service time	default	16.130242	ms
error rate	default	0	%
Min Throughput	term	150.07	ops/s
Median Throughput	term	150.1	ops/s
Max Throughput	term	150.15	ops/s
50th percentile latency	term	2.316147835	ms
90th percentile latency	term	2.610932901	ms
99th percentile latency	term	5.968978318	ms
99.9th percentile latency	term	10.37105939	ms
100th percentile latency	term	12.147341	ms
50th percentile service time	term	2.249188999	ms
90th percentile service time	term	2.5313585	ms
99th percentile service time	term	5.32149807	ms
99.9th percentile service time	term	9.589421289	ms

Metric	Task	Value	Unit
100th percentile service time	term	11.204094	ms
error rate	term	0	%
Min Throughput	phrase	150.07	ops/s
Median Throughput	phrase	150.1	ops/s
Max Throughput	phrase	150.16	ops/s
50th percentile latency	phrase	2.350160666	ms
90th percentile latency	phrase	2.689091867	ms
99th percentile latency	phrase	4.606508314	ms
99.9th percentile latency	phrase	11.32920839	ms
100th percentile latency	phrase	11.53972367	ms
50th percentile service time	phrase	2.283426499	ms
90th percentile service time	phrase	2.6023857	ms
99th percentile service time	phrase	4.073278879	ms
99.9th percentile service time	phrase	11.26236945	ms
100th percentile service time	phrase	11.471612	ms
error rate	phrase	0	%
Min Throughput	country_agg_uncached	4	ops/s
Median Throughput	country_agg_uncached	4.01	ops/s
Max Throughput	country_agg_uncached	4.01	ops/s
50th percentile latency	country_agg_uncached	154.036113	ms

Metric	Task	Value	Unit
90th percentile latency	country_agg_uncached	160.160262	ms
99th percentile latency	country_agg_uncached	217.9470218	ms
100th percentile latency	country_agg_uncached	270.401061	ms
50th percentile service time	country_agg_uncached	153.9164235	ms
90th percentile service time	country_agg_uncached	160.0393962	ms
99th percentile service time	country_agg_uncached	217.8203381	ms
100th percentile service time	country_agg_uncached	270.314704	ms
error rate	country_agg_uncached	0	%
Min Throughput	country_agg_cached	100.04	ops/s
Median Throughput	country_agg_cached	100.06	ops/s
Max Throughput	country_agg_cached	100.07	ops/s
50th percentile latency	country_agg_cached	1.772262999	ms
90th percentile latency	country_agg_cached	1.943878399	ms
99th percentile latency	country_agg_cached	2.796966468	ms
99.9th percentile latency	country_agg_cached	6.427875642	ms
100th percentile latency	country_agg_cached	14.575363	ms
50th percentile service time	country_agg_cached	1.7050655	ms
90th percentile service time	country_agg_cached	1.878483099	ms
99th percentile service time	country_agg_cached	2.689127631	ms

Metric	Task	Value	Unit
99.9th percentile service time	country_agg_cached	4.762661218	ms
100th percentile service time	country_agg_cached	14.506126	ms
error rate	country_agg_cached	0	%
Min Throughput	scroll	20.05	pages/s
Median Throughput	scroll	20.06	pages/s
Max Throughput	scroll	20.07	pages/s
50th percentile latency	scroll	387.0272235	ms
90th percentile latency	scroll	400.7843767	ms
99th percentile latency	scroll	452.1627557	ms
100th percentile latency	scroll	478.26665	ms
50th percentile service time	scroll	386.143462	ms
90th percentile service time	scroll	399.8976064	ms
99th percentile service time	scroll	451.295933	ms
100th percentile service time	scroll	477.360055	ms
error rate	scroll	0	%
Min Throughput	expression	2	ops/s
Median Throughput	expression	2	ops/s
Max Throughput	expression	2	ops/s
50th percentile latency	expression	285.121047	ms
90th percentile latency	expression	292.0323929	ms
99th percentile latency	expression	336.1215281	ms

Metric	Task	Value	Unit
100th percentile latency	expression	389.221478	ms
50th percentile service time	expression	284.883145	ms
90th percentile service time	expression	291.78961	ms
99th percentile service time	expression	335.9078465	ms
100th percentile service time	expression	388.982388	ms
error rate	expression	0	%
Min Throughput	painless_static	1.5	ops/s
Median Throughput	painless_static	1.5	ops/s
Max Throughput	painless_static	1.5	ops/s
50th percentile latency	painless_static	414.4142772	ms
90th percentile latency	painless_static	428.3021712	ms
99th percentile latency	painless_static	551.0764984	ms
100th percentile latency	painless_static	586.564512	ms
50th percentile service time	painless_static	414.134189	ms
90th percentile service time	painless_static	428.0409987	ms
99th percentile service time	painless_static	550.7989791	ms
100th percentile service time	painless_static	586.432656	ms
error rate	painless_static	0	%
Min Throughput	painless_dynamic	1.5	ops/s
Median Throughput	painless_dynamic	1.5	ops/s
Max Throughput	painless_dynamic	1.5	ops/s

Metric	Task	Value	Unit
50th percentile latency	painless_dynamic	387.1022877	ms
90th percentile latency	painless_dynamic	402.260061	ms
99th percentile latency	painless_dynamic	472.1731577	ms
100th percentile latency	painless_dynamic	480.22595	ms
50th percentile service time	painless_dynamic	386.7965725	ms
90th percentile service time	painless_dynamic	401.955634	ms
99th percentile service time	painless_dynamic	471.9657896	ms
100th percentile service time	painless_dynamic	479.91248	ms
error rate	painless_dynamic	0	%
Min Throughput	decay_geo_gauss_function_score	1	ops/s
Median Throughput	decay_geo_gauss_function_score	1	ops/s
Max Throughput	decay_geo_gauss_function_score	1	ops/s
50th percentile latency	decay_geo_gauss_function_score	364.5783855	ms
90th percentile latency	decay_geo_gauss_function_score	369.3249541	ms
99th percentile latency	decay_geo_gauss_function_score	376.4548957	ms
100th percentile latency	decay_geo_gauss_function_score	402.051915	ms
50th percentile service time	decay_geo_gauss_function_score	364.0542175	ms
90th percentile service time	decay_geo_gauss_function_score	368.6669817	ms
99th percentile service time	decay_geo_gauss_function_score	375.7975505	ms

Metric	Task	Value	Unit
100th percentile service time	decay_geo_gauss_function_score	401.399591	ms
error rate	decay_geo_gauss_function_score	0	%
Min Throughput	decay_geo_gauss_script_score	1	ops/s
Median Throughput	decay_geo_gauss_script_score	1	ops/s
Max Throughput	decay_geo_gauss_script_score	1	ops/s
50th percentile latency	decay_geo_gauss_script_score	388.6800445	ms
90th percentile latency	decay_geo_gauss_script_score	404.632834	ms
99th percentile latency	decay_geo_gauss_script_score	450.7542979	ms
100th percentile latency	decay_geo_gauss_script_score	538.551451	ms
50th percentile service time	decay_geo_gauss_script_score	388.0335405	ms
90th percentile service time	decay_geo_gauss_script_score	403.9975599	ms
99th percentile service time	decay_geo_gauss_script_score	450.1032284	ms
100th percentile service time	decay_geo_gauss_script_score	537.919936	ms
error rate	decay_geo_gauss_script_score	0	%
Min Throughput	field_value_function_score	1.5	ops/s
Median Throughput	field_value_function_score	1.5	ops/s
Max Throughput	field_value_function_score	1.51	ops/s
50th percentile latency	field_value_function_score	147.6084107	ms
90th percentile latency	field_value_function_score	161.4163745	ms

Metric	Task	Value	Unit
99th percentile latency	field_value_function_score	218.4858815	ms
100th percentile latency	field_value_function_score	223.5476993	ms
50th percentile service time	field_value_function_score	147.071556	ms
90th percentile service time	field_value_function_score	160.8855899	ms
99th percentile service time	field_value_function_score	217.9465422	ms
100th percentile service time	field_value_function_score	223.080105	ms
error rate	field_value_function_score	0	%
Min Throughput	field_value_script_score	1.5	ops/s
Median Throughput	field_value_script_score	1.5	ops/s
Max Throughput	field_value_script_score	1.51	ops/s
50th percentile latency	field_value_script_score	208.4922433	ms
90th percentile latency	field_value_script_score	213.0348423	ms
99th percentile latency	field_value_script_score	256.5748294	ms
100th percentile latency	field_value_script_score	274.4188643	ms
50th percentile service time	field_value_script_score	208.058553	ms
90th percentile service time	field_value_script_score	212.5744289	ms
99th percentile service time	field_value_script_score	256.1503058	ms
100th percentile service time	field_value_script_score	274.185904	ms
error rate	field_value_script_score	0	%

Metric	Task	Value	Unit
Min Throughput	random_function_score	1.5	ops/s
Median Throughput	random_function_score	1.5	ops/s
Max Throughput	random_function_score	1.5	ops/s
50th percentile latency	random_function_score	244.4104887	ms
90th percentile latency	random_function_score	257.7793149	ms
99th percentile latency	random_function_score	323.8163443	ms
100th percentile latency	random_function_score	376.470245	ms
50th percentile service time	random_function_score	243.9546325	ms
90th percentile service time	random_function_score	257.3440943	ms
99th percentile service time	random_function_score	323.3741708	ms
100th percentile service time	random_function_score	376.091853	ms
error rate	random_function_score	0	%
Min Throughput	random_script_score	1.5	ops/s
Median Throughput	random_script_score	1.5	ops/s
Max Throughput	random_script_score	1.5	ops/s
50th percentile latency	random_script_score	265.276135	ms
90th percentile latency	random_script_score	276.8986875	ms
99th percentile latency	random_script_score	327.6141767	ms
100th percentile latency	random_script_score	339.1401533	ms

Metric	Task	Value	Unit
50th percentile service time	random_script_score	264.845466	ms
90th percentile service time	random_script_score	276.4729421	ms
99th percentile service time	random_script_score	327.2584587	ms
100th percentile service time	random_script_score	338.704812	ms
error rate	random_script_score	0	%
Min Throughput	large_terms	1.5	ops/s
Median Throughput	large_terms	1.5	ops/s
Max Throughput	large_terms	1.5	ops/s
50th percentile latency	large_terms	474.347426	ms
90th percentile latency	large_terms	482.346874	ms
99th percentile latency	large_terms	521.4118005	ms
100th percentile latency	large_terms	529.6919453	ms
50th percentile service time	large_terms	474.1270145	ms
90th percentile service time	large_terms	482.1388748	ms
99th percentile service time	large_terms	521.2451771	ms
100th percentile service time	large_terms	529.479614	ms
error rate	large_terms	0	%
Min Throughput	large_filtered_terms	1.5	ops/s
Median Throughput	large_filtered_terms	1.5	ops/s
Max Throughput	large_filtered_terms	1.5	ops/s
50th percentile latency	large_filtered_terms	475.7995187	ms

Metric	Task	Value	Unit
90th percentile latency	large_filtered_terms	486.3646669	ms
99th percentile latency	large_filtered_terms	565.6174992	ms
100th percentile latency	large_filtered_terms	585.669044	ms
50th percentile service time	large_filtered_terms	475.580755	ms
90th percentile service time	large_filtered_terms	486.1421912	ms
99th percentile service time	large_filtered_terms	565.483224	ms
100th percentile service time	large_filtered_terms	585.452311	ms
error rate	large_filtered_terms	0	%
Min Throughput	large_prohibited_terms	1.5	ops/s
Median Throughput	large_prohibited_terms	1.5	ops/s
Max Throughput	large_prohibited_terms	1.5	ops/s
50th percentile latency	large_prohibited_terms	474.8867557	ms
90th percentile latency	large_prohibited_terms	483.007269	ms
99th percentile latency	large_prohibited_terms	540.355679	ms
100th percentile latency	large_prohibited_terms	574.8374467	ms
50th percentile service time	large_prohibited_terms	474.6650815	ms
90th percentile service time	large_prohibited_terms	482.7923966	ms
99th percentile service time	large_prohibited_terms	540.1352455	ms
100th percentile service time	large_prohibited_terms	574.674312	ms

Metric	Task	Value	Unit
error rate	large_prohibited_terms	0	%
Min Throughput	desc_sort_population	1.5	ops/s
Median Throughput	desc_sort_population	1.51	ops/s
Max Throughput	desc_sort_population	1.51	ops/s
50th percentile latency	desc_sort_population	49.97947483	ms
90th percentile latency	desc_sort_population	52.97220567	ms
99th percentile latency	desc_sort_population	65.81446927	ms
100th percentile latency	desc_sort_population	68.243857	ms
50th percentile service time	desc_sort_population	49.3373975	ms
90th percentile service time	desc_sort_population	52.3443909	ms
99th percentile service time	desc_sort_population	65.17446437	ms
100th percentile service time	desc_sort_population	67.595051	ms
error rate	desc_sort_population	0	%
Min Throughput	asc_sort_population	1.5	ops/s
Median Throughput	asc_sort_population	1.51	ops/s
Max Throughput	asc_sort_population	1.51	ops/s
50th percentile latency	asc_sort_population	50.29814734	ms
90th percentile latency	asc_sort_population	54.12596357	ms
99th percentile latency	asc_sort_population	57.9221302	ms

Metric	Task	Value	Unit
100th percentile latency	asc_sort_population	69.35533	ms
50th percentile service time	asc_sort_population	49.667352	ms
90th percentile service time	asc_sort_population	53.4878858	ms
99th percentile service time	asc_sort_population	57.2779194	ms
100th percentile service time	asc_sort_population	68.714241	ms
error rate	asc_sort_population	0	%
Min Throughput	desc_sort_geonameid	1.5	ops/s
Median Throughput	desc_sort_geonameid	1.51	ops/s
Max Throughput	desc_sort_geonameid	1.51	ops/s
50th percentile latency	desc_sort_geonameid	49.2601545	ms
90th percentile latency	desc_sort_geonameid	53.48767223	ms
99th percentile latency	desc_sort_geonameid	69.43293772	ms
100th percentile latency	desc_sort_geonameid	72.512932	ms
50th percentile service time	desc_sort_geonameid	48.6107425	ms
90th percentile service time	desc_sort_geonameid	52.839748	ms
99th percentile service time	desc_sort_geonameid	68.79282147	ms
100th percentile service time	desc_sort_geonameid	71.872758	ms
error rate	desc_sort_geonameid	0	%
Min Throughput	asc_sort_geonameid	1.5	ops/s

Metric	Task	Value	Unit
Median Throughput	asc_sort_geonameid	1.51	ops/s
Max Throughput	asc_sort_geonameid	1.51	ops/s
50th percentile latency	asc_sort_geonameid	47.071104	ms
90th percentile latency	asc_sort_geonameid	50.264151	ms
99th percentile latency	asc_sort_geonameid	57.9888054	ms
100th percentile latency	asc_sort_geonameid	96.39665433	ms
50th percentile service time	asc_sort_geonameid	46.427649	ms
90th percentile service time	asc_sort_geonameid	49.6192723	ms
99th percentile service time	asc_sort_geonameid	57.75922607	ms
100th percentile service time	asc_sort_geonameid	95.751176	ms
error rate	asc_sort_geonameid	0	%

11.3 ess.spec-4u16g 规格、节点数为 3 的集群性能测试

节点规格为ess.spec-4u16g、节点数为3的集群性能测试结果如下。

Metric	Task	Value	Unit
Cumulative indexing time of primary shards	-	11.95073333	min
Min cumulative indexing time across primary shards	-	0	min
Median cumulative indexing time across primary shards	-	2.339941667	min

Metric	Task	Value	Unit
Max cumulative indexing time across primary shards	-	2.470116667	min
Cumulative indexing throttle time of primary shards	-	0	min
Min cumulative indexing throttle time across primary shards	-	0	min
Median cumulative indexing throttle time across primary shards	-	0	min
Max cumulative indexing throttle time across primary shards	-	0	min
Cumulative merge time of primary shards	-	4.21495	min
Cumulative merge count of primary shards	-	65	-
Min cumulative merge time across primary shards	-	0	min
Median cumulative merge time across primary shards	-	0.813216667	min
Max cumulative merge time across primary shards	-	0.974483333	min
Cumulative merge throttle time of primary shards	-	0.83345	min
Min cumulative merge throttle time across primary shards	-	0	min

Metric	Task	Value	Unit
Median cumulative merge throttle time across primary shards	-	0.157775	min
Max cumulative merge throttle time across primary shards	-	0.24605	min
Cumulative refresh time of primary shards	-	2.164983333	min
Cumulative refresh count of primary shards	-	291	-
Min cumulative refresh time across primary shards	-	0	min
Median cumulative refresh time across primary shards	-	0.425391667	min
Max cumulative refresh time across primary shards	-	0.450516667	min
Cumulative flush time of primary shards	-	0.1559	min
Cumulative flush count of primary shards	-	11	-
Min cumulative flush time across primary shards	-	0	min
Median cumulative flush time across primary shards	-	0.0248	min
Max cumulative flush time across primary shards	-	0.043433333	min
Total Young Gen GC	-	6.421	s
Total Old Gen GC	-	0	s
Store size	-	3.124213032	GB

Metric	Task	Value	Unit
Translog size	-	2.790678718	GB
Heap used for segments	-	15.03110981	MB
Heap used for doc values	-	0.043689728	MB
Heap used for terms	-	13.85075188	MB
Heap used for norms	-	0.077697754	MB
Heap used for points	-	0.266856194	MB
Heap used for stored fields	-	0.792114258	MB
Segment count	-	99	-
Min Throughput	index-append	92446.94	docs/s
Median Throughput	index-append	92935.55	docs/s
Max Throughput	index-append	93217.68	docs/s
50th percentile latency	index-append	176.7329985	ms
90th percentile latency	index-append	285.5450693	ms
100th percentile latency	index-append	333.228537	ms
50th percentile service time	index-append	176.7329985	ms
90th percentile service time	index-append	285.5450693	ms
100th percentile service time	index-append	333.228537	ms
error rate	index-append	0	%
Min Throughput	index-stats	90.04	ops/s
Median Throughput	index-stats	90.06	ops/s
Max Throughput	index-stats	90.11	ops/s
50th percentile latency	index-stats	3.6713165	ms

Metric	Task	Value	Unit
90th percentile latency	index-stats	3.919960223	ms
99th percentile latency	index-stats	4.500246093	ms
99.9th percentile latency	index-stats	20.14171663	ms
100th percentile latency	index-stats	21.36778278	ms
50th percentile service time	index-stats	3.604376499	ms
90th percentile service time	index-stats	3.8517339	ms
99th percentile service time	index-stats	4.36148177	ms
99.9th percentile service time	index-stats	20.0748024	ms
100th percentile service time	index-stats	21.300971	ms
error rate	index-stats	0	%
Min Throughput	node-stats	90.05	ops/s
Median Throughput	node-stats	90.09	ops/s
Max Throughput	node-stats	90.32	ops/s
50th percentile latency	node-stats	4.056046	ms
90th percentile latency	node-stats	4.256959922	ms
99th percentile latency	node-stats	7.993649534	ms
99.9th percentile latency	node-stats	15.0162469	ms
100th percentile latency	node-stats	18.79192022	ms
50th percentile service time	node-stats	3.989104	ms
90th percentile service time	node-stats	4.1902188	ms

Metric	Task	Value	Unit
99th percentile service time	node-stats	7.39785926	ms
99.9th percentile service time	node-stats	14.95028028	ms
100th percentile service time	node-stats	15.226284	ms
error rate	node-stats	0	%
Min Throughput	default	50.03	ops/s
Median Throughput	default	50.04	ops/s
Max Throughput	default	50.09	ops/s
50th percentile latency	default	2.890284501	ms
90th percentile latency	default	3.054330301	ms
99th percentile latency	default	3.41013575	ms
99.9th percentile latency	default	4.536945459	ms
100th percentile latency	default	5.063877001	ms
50th percentile service time	default	2.82345	ms
90th percentile service time	default	2.987489999	ms
99th percentile service time	default	3.34539951	ms
99.9th percentile service time	default	4.466092296	ms
100th percentile service time	default	4.996857	ms
error rate	default	0	%
Min Throughput	term	150.06	ops/s
Median Throughput	term	150.09	ops/s
Max Throughput	term	150.14	ops/s
50th percentile latency	term	2.822069666	ms

Metric	Task	Value	Unit
90th percentile latency	term	2.927460233	ms
99th percentile latency	term	3.585279107	ms
99.9th percentile latency	term	9.586351776	ms
100th percentile latency	term	13.36534567	ms
50th percentile service time	term	2.755832	ms
90th percentile service time	term	2.8613018	ms
99th percentile service time	term	3.4037467	ms
99.9th percentile service time	term	4.571924473	ms
100th percentile service time	term	13.301659	ms
error rate	term	0	%
Min Throughput	phrase	149.99	ops/s
Median Throughput	phrase	150.07	ops/s
Max Throughput	phrase	150.13	ops/s
50th percentile latency	phrase	3.207932333	ms
90th percentile latency	phrase	3.514073	ms
99th percentile latency	phrase	26.65015757	ms
99.9th percentile latency	phrase	38.92041855	ms
100th percentile latency	phrase	40.044182	ms
50th percentile service time	phrase	3.1409695	ms
90th percentile service time	phrase	3.3666699	ms

Metric	Task	Value	Unit
99th percentile service time	phrase	9.39342965	ms
99.9th percentile service time	phrase	18.80974216	ms
100th percentile service time	phrase	21.417291	ms
error rate	phrase	0	%
Min Throughput	country_agg_uncached	4.01	ops/s
Median Throughput	country_agg_uncached	4.01	ops/s
Max Throughput	country_agg_uncached	4.01	ops/s
50th percentile latency	country_agg_uncached	153.726532	ms
90th percentile latency	country_agg_uncached	156.0977097	ms
99th percentile latency	country_agg_uncached	167.696362	ms
100th percentile latency	country_agg_uncached	198.43754	ms
50th percentile service time	country_agg_uncached	153.606521	ms
90th percentile service time	country_agg_uncached	155.9869715	ms
99th percentile service time	country_agg_uncached	167.5793267	ms
100th percentile service time	country_agg_uncached	198.325432	ms
error rate	country_agg_uncached	0	%
Min Throughput	country_agg_cached	100.04	ops/s
Median Throughput	country_agg_cached	100.05	ops/s
Max Throughput	country_agg_cached	100.07	ops/s

Metric	Task	Value	Unit
50th percentile latency	country_agg_cached	2.7020445	ms
90th percentile latency	country_agg_cached	2.783604899	ms
99th percentile latency	country_agg_cached	3.03382523	ms
99.9th percentile latency	country_agg_cached	3.635769276	ms
100th percentile latency	country_agg_cached	4.106574	ms
50th percentile service time	country_agg_cached	2.6356045	ms
90th percentile service time	country_agg_cached	2.717349899	ms
99th percentile service time	country_agg_cached	2.93948264	ms
99.9th percentile service time	country_agg_cached	3.567144201	ms
100th percentile service time	country_agg_cached	4.039871999	ms
error rate	country_agg_cached	0	%
Min Throughput	scroll	20.04	pages/s
Median Throughput	scroll	20.05	pages/s
Max Throughput	scroll	20.07	pages/s
50th percentile latency	scroll	421.9468245	ms
90th percentile latency	scroll	433.3017323	ms
99th percentile latency	scroll	450.0724775	ms
100th percentile latency	scroll	505.502723	ms
50th percentile service time	scroll	421.0948965	ms
90th percentile service time	scroll	432.4389587	ms

Metric	Task	Value	Unit
99th percentile service time	scroll	449.2045264	ms
100th percentile service time	scroll	504.653479	ms
error rate	scroll	0	%
Min Throughput	expression	2	ops/s
Median Throughput	expression	2	ops/s
Max Throughput	expression	2	ops/s
50th percentile latency	expression	270.920167	ms
90th percentile latency	expression	277.4334041	ms
99th percentile latency	expression	286.5631326	ms
100th percentile latency	expression	293.09254	ms
50th percentile service time	expression	270.662187	ms
90th percentile service time	expression	277.1779957	ms
99th percentile service time	expression	286.3073191	ms
100th percentile service time	expression	292.826178	ms
error rate	expression	0	%
Min Throughput	painless_static	1.5	ops/s
Median Throughput	painless_static	1.5	ops/s
Max Throughput	painless_static	1.5	ops/s
50th percentile latency	painless_static	360.9218617	ms
90th percentile latency	painless_static	368.2584616	ms
99th percentile latency	painless_static	382.3877013	ms
100th percentile latency	painless_static	425.989704	ms

Metric	Task	Value	Unit
50th percentile service time	painless_static	360.5910995	ms
90th percentile service time	painless_static	367.9205895	ms
99th percentile service time	painless_static	382.0613883	ms
100th percentile service time	painless_static	425.659728	ms
error rate	painless_static	0	%
Min Throughput	painless_dynamic	1.5	ops/s
Median Throughput	painless_dynamic	1.5	ops/s
Max Throughput	painless_dynamic	1.5	ops/s
50th percentile latency	painless_dynamic	354.4270103	ms
90th percentile latency	painless_dynamic	362.9108269	ms
99th percentile latency	painless_dynamic	409.7732626	ms
100th percentile latency	painless_dynamic	410.1049017	ms
50th percentile service time	painless_dynamic	354.0901565	ms
90th percentile service time	painless_dynamic	362.5730453	ms
99th percentile service time	painless_dynamic	409.4442952	ms
100th percentile service time	painless_dynamic	409.777646	ms
error rate	painless_dynamic	0	%
Min Throughput	decay_geo_gauss_function_score	1	ops/s
Median Throughput	decay_geo_gauss_function_score	1	ops/s

Metric	Task	Value	Unit
Max Throughput	decay_geo_gauss_function_score	1	ops/s
50th percentile latency	decay_geo_gauss_function_score	354.387216	ms
90th percentile latency	decay_geo_gauss_function_score	358.9124798	ms
99th percentile latency	decay_geo_gauss_function_score	363.9485787	ms
100th percentile latency	decay_geo_gauss_function_score	371.780245	ms
50th percentile service time	decay_geo_gauss_function_score	353.7158425	ms
90th percentile service time	decay_geo_gauss_function_score	358.2845019	ms
99th percentile service time	decay_geo_gauss_function_score	363.275623	ms
100th percentile service time	decay_geo_gauss_function_score	371.114045	ms
error rate	decay_geo_gauss_function_score	0	%
Min Throughput	decay_geo_gauss_script_score	1	ops/s
Median Throughput	decay_geo_gauss_script_score	1	ops/s
Max Throughput	decay_geo_gauss_script_score	1	ops/s
50th percentile latency	decay_geo_gauss_script_score	379.4620745	ms
90th percentile latency	decay_geo_gauss_script_score	383.2876548	ms
99th percentile latency	decay_geo_gauss_script_score	389.7544834	ms
100th percentile latency	decay_geo_gauss_script_score	395.75293	ms
50th percentile service time	decay_geo_gauss_script_score	378.8137045	ms
90th percentile service time	decay_geo_gauss_script_score	382.6389076	ms

Metric	Task	Value	Unit
99th percentile service time	decay_geo_gauss_script_score	389.1097136	ms
100th percentile service time	decay_geo_gauss_script_score	395.100654	ms
error rate	decay_geo_gauss_script_score	0	%
Min Throughput	field_value_function_score	1.5	ops/s
Median Throughput	field_value_function_score	1.5	ops/s
Max Throughput	field_value_function_score	1.51	ops/s
50th percentile latency	field_value_function_score	142.4418055	ms
90th percentile latency	field_value_function_score	146.0292471	ms
99th percentile latency	field_value_function_score	149.4448299	ms
100th percentile latency	field_value_function_score	154.4188467	ms
50th percentile service time	field_value_function_score	141.8792295	ms
90th percentile service time	field_value_function_score	145.4722711	ms
99th percentile service time	field_value_function_score	148.8731825	ms
100th percentile service time	field_value_function_score	153.87006	ms
error rate	field_value_function_score	0	%
Min Throughput	field_value_script_score	1.5	ops/s
Median Throughput	field_value_script_score	1.5	ops/s
Max Throughput	field_value_script_score	1.51	ops/s
50th percentile latency	field_value_script_score	200.310233	ms

Metric	Task	Value	Unit
90th percentile latency	field_value_script_score	206.2690364	ms
99th percentile latency	field_value_script_score	216.7453505	ms
100th percentile latency	field_value_script_score	252.6694313	ms
50th percentile service time	field_value_script_score	199.886616	ms
90th percentile service time	field_value_script_score	205.7897592	ms
99th percentile service time	field_value_script_score	216.2602712	ms
100th percentile service time	field_value_script_score	252.180659	ms
error rate	field_value_script_score	0	%
Min Throughput	random_function_score	1.5	ops/s
Median Throughput	random_function_score	1.5	ops/s
Max Throughput	random_function_score	1.5	ops/s
50th percentile latency	random_function_score	242.6018717	ms
90th percentile latency	random_function_score	251.1366288	ms
99th percentile latency	random_function_score	290.9842466	ms
100th percentile latency	random_function_score	307.5584597	ms
50th percentile service time	random_function_score	242.149128	ms
90th percentile service time	random_function_score	250.6830153	ms
99th percentile service time	random_function_score	290.5378949	ms
100th percentile service time	random_function_score	307.111375	ms

Metric	Task	Value	Unit
error rate	random_function_score	0	%
Min Throughput	random_script_score	1.5	ops/s
Median Throughput	random_script_score	1.5	ops/s
Max Throughput	random_script_score	1.5	ops/s
50th percentile latency	random_script_score	258.3288777	ms
90th percentile latency	random_script_score	262.5996219	ms
99th percentile latency	random_script_score	276.7350459	ms
100th percentile latency	random_script_score	278.8234443	ms
50th percentile service time	random_script_score	257.8902625	ms
90th percentile service time	random_script_score	262.1680452	ms
99th percentile service time	random_script_score	276.3056912	ms
100th percentile service time	random_script_score	278.384714	ms
error rate	random_script_score	0	%
Min Throughput	large_terms	1.5	ops/s
Median Throughput	large_terms	1.5	ops/s
Max Throughput	large_terms	1.5	ops/s
50th percentile latency	large_terms	429.023917	ms
90th percentile latency	large_terms	438.5573247	ms
99th percentile latency	large_terms	468.2661402	ms
100th percentile latency	large_terms	494.4412297	ms

Metric	Task	Value	Unit
50th percentile service time	large_terms	428.772941	ms
90th percentile service time	large_terms	438.29435	ms
99th percentile service time	large_terms	468.0068679	ms
100th percentile service time	large_terms	494.168992	ms
error rate	large_terms	0	%
Min Throughput	large_filtered_terms	1.5	ops/s
Median Throughput	large_filtered_terms	1.5	ops/s
Max Throughput	large_filtered_terms	1.5	ops/s
50th percentile latency	large_filtered_terms	433.0397738	ms
90th percentile latency	large_filtered_terms	443.241508	ms
99th percentile latency	large_filtered_terms	460.8045067	ms
100th percentile latency	large_filtered_terms	486.396965	ms
50th percentile service time	large_filtered_terms	432.7802525	ms
90th percentile service time	large_filtered_terms	442.9739873	ms
99th percentile service time	large_filtered_terms	460.7444745	ms
100th percentile service time	large_filtered_terms	486.145846	ms
error rate	large_filtered_terms	0	%
Min Throughput	large_prohibited_terms	1.5	ops/s
Median Throughput	large_prohibited_terms	1.5	ops/s

Metric	Task	Value	Unit
Max Throughput	large_prohibited_terms	1.5	ops/s
50th percentile latency	large_prohibited_terms	430.1467708	ms
90th percentile latency	large_prohibited_terms	436.8730103	ms
99th percentile latency	large_prohibited_terms	484.5697929	ms
100th percentile latency	large_prohibited_terms	492.75088	ms
50th percentile service time	large_prohibited_terms	429.8833325	ms
90th percentile service time	large_prohibited_terms	436.6196592	ms
99th percentile service time	large_prohibited_terms	484.3087876	ms
100th percentile service time	large_prohibited_terms	492.492977	ms
error rate	large_prohibited_terms	0	%
Min Throughput	desc_sort_population	1.5	ops/s
Median Throughput	desc_sort_population	1.51	ops/s
Max Throughput	desc_sort_population	1.51	ops/s
50th percentile latency	desc_sort_population	45.9402765	ms
90th percentile latency	desc_sort_population	49.01190953	ms
99th percentile latency	desc_sort_population	58.5120831	ms
100th percentile latency	desc_sort_population	60.027354	ms
50th percentile service time	desc_sort_population	45.2962825	ms
90th percentile service time	desc_sort_population	48.3757462	ms

Metric	Task	Value	Unit
99th percentile service time	desc_sort_population	57.86711494	ms
100th percentile service time	desc_sort_population	59.377354	ms
error rate	desc_sort_population	0	%
Min Throughput	asc_sort_population	1.5	ops/s
Median Throughput	asc_sort_population	1.51	ops/s
Max Throughput	asc_sort_population	1.51	ops/s
50th percentile latency	asc_sort_population	46.02105783	ms
90th percentile latency	asc_sort_population	48.79212977	ms
99th percentile latency	asc_sort_population	55.94577758	ms
100th percentile latency	asc_sort_population	72.898199	ms
50th percentile service time	asc_sort_population	45.37886	ms
90th percentile service time	asc_sort_population	48.1426418	ms
99th percentile service time	asc_sort_population	55.30153109	ms
100th percentile service time	asc_sort_population	72.260339	ms
error rate	asc_sort_population	0	%
Min Throughput	desc_sort_geonameid	1.5	ops/s
Median Throughput	desc_sort_geonameid	1.51	ops/s
Max Throughput	desc_sort_geonameid	1.51	ops/s
50th percentile latency	desc_sort_geonameid	52.22274167	ms

Metric	Task	Value	Unit
90th percentile latency	desc_sort_geonameid	69.4325779	ms
99th percentile latency	desc_sort_geonameid	79.57920996	ms
100th percentile latency	desc_sort_geonameid	80.11872267	ms
50th percentile service time	desc_sort_geonameid	51.6055115	ms
90th percentile service time	desc_sort_geonameid	68.801679	ms
99th percentile service time	desc_sort_geonameid	79.41158055	ms
100th percentile service time	desc_sort_geonameid	79.465491	ms
error rate	desc_sort_geonameid	0	%
Min Throughput	asc_sort_geonameid	1.5	ops/s
Median Throughput	asc_sort_geonameid	1.51	ops/s
Max Throughput	asc_sort_geonameid	1.51	ops/s
50th percentile latency	asc_sort_geonameid	51.35154333	ms
90th percentile latency	asc_sort_geonameid	52.2966503	ms
99th percentile latency	asc_sort_geonameid	55.33079961	ms
100th percentile latency	asc_sort_geonameid	55.520544	ms
50th percentile service time	asc_sort_geonameid	50.7138335	ms
90th percentile service time	asc_sort_geonameid	51.6588923	ms
99th percentile service time	asc_sort_geonameid	54.68967127	ms
100th percentile service time	asc_sort_geonameid	54.874135	ms

Metric	Task	Value	Unit
error rate	asc_sort_geonameid	0	%

11.4 ess.spec-2u8g 规格与 ess.spec-4u16g 规格的集群性能测试对比

节点规格为ess.spec-2u8g、节点数为3的集群，与节点规格为ess.spec-4u16g、节点数为3的集群性能测试结果对比如下。

Metric	Task	Baseline	Contender	Diff	Unit
Cumulative indexing time of primary shards	-	11.48263333	11.95073333	-0.468099997	min
Min cumulative indexing time across primary shards	-	0	0	0	min
Median cumulative indexing time across primary shards	-	2.313783333	2.339941667	-0.026158334	min
Max cumulative indexing time across primary shards	-	2.401766667	2.470116667	-0.06835	min
Cumulative indexing throttle time of primary shards	-	0	0	0	min
Min cumulative indexing throttle time across primary shards	-	0	0	0	min

Metric	Task	Baseline	Contender	Diff	Unit
Median cumulative indexing throttle time across primary shards	-	0	0	0	min
Max cumulative indexing throttle time across primary shards	-	0	0	0	min
Cumulative merge time of primary shards	-	6.466066667	4.21495	2.251116667	min
Cumulative merge count of primary shards	-	85	65	20	-
Min cumulative merge time across primary shards	-	0	0	0	min
Median cumulative merge time across primary shards	-	1.257475	0.813216667	0.444258333	min
Max cumulative merge time across primary shards	-	1.417283333	0.974483333	0.4428	min
Cumulative merge throttle time of primary shards	-	1.089583333	0.83345	0.256133333	min
Min cumulative merge throttle time across primary shards	-	0	0	0	min

Metric	Task	Baseline	Contender	Diff	Unit
Median cumulative merge throttle time across primary shards	-	0.200458333	0.157775	0.042683333	min
Max cumulative merge throttle time across primary shards	-	0.28265	0.24605	0.0366	min
Cumulative refresh time of primary shards	-	3.641266667	2.164983333	1.476283334	min
Cumulative refresh count of primary shards	-	530	291	239	-
Min cumulative refresh time across primary shards	-	0	0	0	min
Median cumulative refresh time across primary shards	-	0.725791667	0.425391667	0.3004	min
Max cumulative refresh time across primary shards	-	0.74775	0.450516667	0.297233333	min
Cumulative flush time of primary shards	-	0.3056	0.1559	0.1497	min
Cumulative flush count of primary shards	-	11	11	0	-
Min cumulative flush time across primary shards	-	0	0	0	min

Metric	Task	Baseline	Contender	Diff	Unit
Median cumulative flush time across primary shards	-	0.059858333	0.0248	0.035058333	min
Max cumulative flush time across primary shards	-	0.09155	0.043433333	0.048116667	min
Total Young Gen GC	-	11.519	6.421	5.098	s
Total Old Gen GC	-	0	0	0	s
Store size	-	3.045436038	3.124213032	-0.078776994	GB
Translog size	-	2.791873856	2.790678718	0.001195138	GB
Heap used for segments	-	15.81298065	15.03110981	0.781870842	MB
Heap used for doc values	-	0.037128448	0.043689728	-0.00656128	MB
Heap used for terms	-	14.63806534	13.85075188	0.787313458	MB
Heap used for norms	-	0.073120117	0.077697754	-0.004577637	MB
Heap used for points	-	0.272666931	0.266856194	0.005810737	MB
Heap used for stored fields	-	0.791999817	0.792114258	-0.000114441	MB
Segment count	-	95	99	-4	-
Min Throughput	index-append	41705.19	92446.94	-50741.75	docs/s
Median Throughput	index-append	46911.27	92935.55	-46024.28	docs/s
Max Throughput	index-append	47765.4	93217.68	-45452.28	docs/s

Metric	Task	Baseline	Contender	Diff	Unit
50th percentile latency	index-append	642.339781	176.732998 5	465.6067825	ms
90th percentile latency	index-append	1114.672936	285.5450693	829.1278669	ms
99th percentile latency	index-append	1733.648438	-	1733.648438	ms
99.9th percentile latency	index-append	4770.059011	-	4770.059011	ms
100th percentile latency	index-append	7045.246771	333.228537	6712.018234	ms
50th percentile service time	index-append	642.339781	176.732998 5	465.6067825	ms
90th percentile service time	index-append	1114.672936	285.5450693	829.1278669	ms
99th percentile service time	index-append	1733.648438	-	1733.648438	ms
99.9th percentile service time	index-append	4770.059011	-	4770.059011	ms
100th percentile service time	index-append	7045.246771	333.228537	6712.018234	ms
error rate	index-append	0	0	0	%
Min Throughput	index-stats	90.05	90.04	0.01	ops/s
Median Throughput	index-stats	90.07	90.06	0.01	ops/s
Max Throughput	index-stats	90.12	90.11	0.01	ops/s
50th percentile latency	index-stats	2.834653556	3.6713165	-0.836662944	ms
90th percentile latency	index-stats	3.527868712	3.919960223	-0.392091511	ms
99th percentile latency	index-stats	4.332674769	4.500246093	-0.167571324	ms

Metric	Task	Baseline	Contender	Diff	Unit
99.9th percentile latency	index-stats	8.392195267	20.14171663	-11.74952136	ms
100th percentile latency	index-stats	9.692270112	21.36778278	-11.67551267	ms
50th percentile service time	index-stats	2.766648	3.604376499	-0.837728499	ms
90th percentile service time	index-stats	3.448194001	3.8517339	-0.403539899	ms
99th percentile service time	index-stats	4.26309684	4.36148177	-0.09838493	ms
99.9th percentile service time	index-stats	8.322068306	20.0748024	-11.75273409	ms
100th percentile service time	index-stats	9.624071001	21.300971	-11.6769	ms
error rate	index-stats	0	0	0	%
Min Throughput	node-stats	90.06	90.05	0.01	ops/s
Median Throughput	node-stats	90.1	90.09	0.01	ops/s
Max Throughput	node-stats	90.35	90.32	0.03	ops/s
50th percentile latency	node-stats	3.205233055	4.056046	-0.850812945	ms
90th percentile latency	node-stats	3.595145422	4.256959922	-0.6618145	ms
99th percentile latency	node-stats	4.469114152	7.993649534	-3.524535382	ms
99.9th percentile latency	node-stats	8.306063762	15.0162469	-6.710183138	ms
100th percentile latency	node-stats	8.748160444	18.79192022	-10.04375978	ms

Metric	Task	Baseline	Contender	Diff	Unit
50th percentile service time	node-stats	3.1379455	3.989104	-0.8511585	ms
90th percentile service time	node-stats	3.5278055	4.1902188	-0.6624133	ms
99th percentile service time	node-stats	4.397312671	7.39785926	-3.000546589	ms
99.9th percentile service time	node-stats	8.236949997	14.95028028	-6.713330283	ms
100th percentile service time	node-stats	8.680502	15.226284	-6.545782	ms
error rate	node-stats	0	0	0	%
Min Throughput	default	50.03	50.03	0	ops/s
Median Throughput	default	50.05	50.04	0.01	ops/s
Max Throughput	default	50.09	50.09	0	ops/s
50th percentile latency	default	2.354736001	2.890284501	-0.5355485	ms
90th percentile latency	default	2.7983462	3.054330301	-0.255984101	ms
99th percentile latency	default	4.591347725	3.410135757	1.18121197	ms
99.9th percentile latency	default	13.97301623	4.536945459	9.436070774	ms
100th percentile latency	default	16.199022	5.063877001	11.135145	ms
50th percentile service time	default	2.286799	2.82345	-0.536651	ms
90th percentile service time	default	2.7289099	2.987489999	-0.258580099	ms
99th percentile service time	default	4.511846871	3.345399551	1.166447361	ms

Metric	Task	Baseline	Contender	Diff	Unit
99.9th percentile service time	default	13.90608139	4.466092296	9.439989092	ms
100th percentile service time	default	16.130242	4.996857	11.133385	ms
error rate	default	0	0	0	%
Min Throughput	term	150.07	150.06	0.01	ops/s
Median Throughput	term	150.1	150.09	0.01	ops/s
Max Throughput	term	150.15	150.14	0.01	ops/s
50th percentile latency	term	2.316147835	2.822069666	-0.505921831	ms
90th percentile latency	term	2.610932901	2.927460233	-0.316527332	ms
99th percentile latency	term	5.968978318	3.585279107	2.383699211	ms
99.9th percentile latency	term	10.37105939	9.586351776	0.784707617	ms
100th percentile latency	term	12.147341	13.36534567	-1.218004668	ms
50th percentile service time	term	2.249188999	2.755832	-0.506643001	ms
90th percentile service time	term	2.5313585	2.8613018	-0.3299433	ms
99th percentile service time	term	5.32149807	3.4037467	1.91775137	ms
99.9th percentile service time	term	9.589421289	4.571924473	5.017496816	ms
100th percentile service time	term	11.204094	13.301659	-2.097565	ms
error rate	term	0	0	0	%

Metric	Task	Baseline	Contender	Diff	Unit
Min Throughput	phrase	150.07	149.99	0.08	ops/s
Median Throughput	phrase	150.1	150.07	0.03	ops/s
Max Throughput	phrase	150.16	150.13	0.03	ops/s
50th percentile latency	phrase	2.350160666	3.207932333	-0.857771667	ms
90th percentile latency	phrase	2.689091867	3.514073	-0.824981133	ms
99th percentile latency	phrase	4.606508314	26.65015757	-22.04364926	ms
99.9th percentile latency	phrase	11.32920839	38.92041855	-27.59121016	ms
100th percentile latency	phrase	11.53972367	40.044182	-28.50445833	ms
50th percentile service time	phrase	2.283426499	3.1409695	-0.857543001	ms
90th percentile service time	phrase	2.6023857	3.3666699	-0.7642842	ms
99th percentile service time	phrase	4.073278879	9.39342965	-5.320150771	ms
99.9th percentile service time	phrase	11.26236945	18.80974216	-7.547372708	ms
100th percentile service time	phrase	11.471612	21.417291	-9.945678999	ms
error rate	phrase	0	0	0	%
Min Throughput	country_agg_uncached	4	4.01	-0.01	ops/s
Median Throughput	country_agg_uncached	4.01	4.01	0	ops/s
Max Throughput	country_agg_uncached	4.01	4.01	0	ops/s

Metric	Task	Baseline	Contender	Diff	Unit
50th percentile latency	country_agg_uncached	154.036113	153.726532	0.309581	ms
90th percentile latency	country_agg_uncached	160.160262	156.097097	4.062552299	ms
99th percentile latency	country_agg_uncached	217.9470218	167.696362	50.25065978	ms
100th percentile latency	country_agg_uncached	270.401061	198.43754	71.963521	ms
50th percentile service time	country_agg_uncached	153.9164235	153.606521	0.3099025	ms
90th percentile service time	country_agg_uncached	160.0393962	155.9869715	4.052424699	ms
99th percentile service time	country_agg_uncached	217.8203381	167.5793267	50.24101142	ms
100th percentile service time	country_agg_uncached	270.314704	198.325432	71.989272	ms
error rate	country_agg_uncached	0	0	0	%
Min Throughput	country_agg_cached	100.04	100.04	0	ops/s
Median Throughput	country_agg_cached	100.06	100.05	0.01	ops/s
Max Throughput	country_agg_cached	100.07	100.07	0	ops/s
50th percentile latency	country_agg_cached	1.772262999	2.7020445	-0.929781501	ms
90th percentile latency	country_agg_cached	1.943878399	2.783604899	-0.8397265	ms
99th percentile latency	country_agg_cached	2.796966468	3.03382523	-0.236858762	ms
99.9th percentile latency	country_agg_cached	6.427875642	3.635769276	2.792106366	ms
100th percentile latency	country_agg_cached	14.575363	4.106574	10.468789	ms

Metric	Task	Baseline	Contender	Diff	Unit
50th percentile service time	country_agg_cached	1.7050655	2.6356045	-0.930539	ms
90th percentile service time	country_agg_cached	1.878483099	2.717349899	-0.8388668	ms
99th percentile service time	country_agg_cached	2.689127631	2.93948264	-0.250355009	ms
99.9th percentile service time	country_agg_cached	4.762661218	3.567144201	1.195517017	ms
100th percentile service time	country_agg_cached	14.506126	4.039871999	10.466254	ms
error rate	country_agg_cached	0	0	0	%
Min Throughput	scroll	20.05	20.04	0.01	pages/s
Median Throughput	scroll	20.06	20.05	0.01	pages/s
Max Throughput	scroll	20.07	20.07	0	pages/s
50th percentile latency	scroll	387.0272235	421.9468245	-34.919601	ms
90th percentile latency	scroll	400.7843767	433.3017323	-32.5173556	ms
99th percentile latency	scroll	452.1627557	450.0724775	2.090278199	ms
100th percentile latency	scroll	478.26665	505.502723	-27.236073	ms
50th percentile service time	scroll	386.143462	421.0948965	-34.9514345	ms
90th percentile service time	scroll	399.8976064	432.4389587	-32.5413523	ms
99th percentile service time	scroll	451.295933	449.2045264	2.091406559	ms
100th percentile service time	scroll	477.360055	504.653479	-27.293424	ms

Metric	Task	Baseline	Contender	Diff	Unit
error rate	scroll	0	0	0	%
Min Throughput	expression	2	2	0	ops/s
Median Throughput	expression	2	2	0	ops/s
Max Throughput	expression	2	2	0	ops/s
50th percentile latency	expression	285.121047	270.920167	14.20088	ms
90th percentile latency	expression	292.0323929	277.4334041	14.5989888	ms
99th percentile latency	expression	336.1215281	286.5631326	49.55839553	ms
100th percentile latency	expression	389.221478	293.09254	96.128938	ms
50th percentile service time	expression	284.883145	270.662187	14.220958	ms
90th percentile service time	expression	291.78961	277.1779957	14.6116143	ms
99th percentile service time	expression	335.9078465	286.3073191	49.60052738	ms
100th percentile service time	expression	388.982388	292.826178	96.15621	ms
error rate	expression	0	0	0	%
Min Throughput	painless_static	1.5	1.5	0	ops/s
Median Throughput	painless_static	1.5	1.5	0	ops/s
Max Throughput	painless_static	1.5	1.5	0	ops/s
50th percentile latency	painless_static	414.4142772	360.9218617	53.49241547	ms
90th percentile latency	painless_static	428.3021712	368.2584616	60.04370963	ms

Metric	Task	Baseline	Contender	Diff	Unit
99th percentile latency	painless_static	551.0764984	382.3877013	168.6887971	ms
100th percentile latency	painless_static	586.564512	425.989704	160.574808	ms
50th percentile service time	painless_static	414.134189	360.5910995	53.5430895	ms
90th percentile service time	painless_static	428.0409987	367.9205895	60.1204092	ms
99th percentile service time	painless_static	550.7989791	382.0613883	168.7375908	ms
100th percentile service time	painless_static	586.432656	425.659728	160.772928	ms
error rate	painless_static	0	0	0	%
Min Throughput	painless_dynamic	1.5	1.5	0	ops/s
Median Throughput	painless_dynamic	1.5	1.5	0	ops/s
Max Throughput	painless_dynamic	1.5	1.5	0	ops/s
50th percentile latency	painless_dynamic	387.1022877	354.4270103	32.67527737	ms
90th percentile latency	painless_dynamic	402.260061	362.9108269	39.34923413	ms
99th percentile latency	painless_dynamic	472.1731577	409.7732626	62.39989507	ms
100th percentile latency	painless_dynamic	480.22595	410.1049017	70.1210483	ms
50th percentile service time	painless_dynamic	386.7965725	354.0901565	32.706416	ms
90th percentile service time	painless_dynamic	401.955634	362.5730453	39.3825887	ms
99th percentile service time	painless_dynamic	471.9657896	409.4442952	62.5214944	ms

Metric	Task	Baseline	Contender	Diff	Unit
100th percentile service time	painless_dynamic	479.91248	409.777646	70.134834	ms
error rate	painless_dynamic	0	0	0	%
Min Throughput	decay_geo_gauss_function_score	1	1	0	ops/s
Median Throughput	decay_geo_gauss_function_score	1	1	0	ops/s
Max Throughput	decay_geo_gauss_function_score	1	1	0	ops/s
50th percentile latency	decay_geo_gauss_function_score	364.5783855	354.387216	10.1911695	ms
90th percentile latency	decay_geo_gauss_function_score	369.3249541	358.9124798	10.4124743	ms
99th percentile latency	decay_geo_gauss_function_score	376.4548957	363.9485787	12.50631705	ms
100th percentile latency	decay_geo_gauss_function_score	402.051915	371.780245	30.27167	ms
50th percentile service time	decay_geo_gauss_function_score	364.0542175	353.7158425	10.338375	ms
90th percentile service time	decay_geo_gauss_function_score	368.6669817	358.2845019	10.3824798	ms
99th percentile service time	decay_geo_gauss_function_score	375.7975505	363.275623	12.52192747	ms
100th percentile service time	decay_geo_gauss_function_score	401.399591	371.114045	30.285546	ms

Metric	Task	Baseline	Contender	Diff	Unit
error rate	decay_geo_gauss_function_score	0	0	0	%
Min Throughput	decay_geo_gauss_script_score	1	1	0	ops/s
Median Throughput	decay_geo_gauss_script_score	1	1	0	ops/s
Max Throughput	decay_geo_gauss_script_score	1	1	0	ops/s
50th percentile latency	decay_geo_gauss_script_score	388.6800445	379.4620745	9.21797	ms
90th percentile latency	decay_geo_gauss_script_score	404.632834	383.2876548	21.3451792	ms
99th percentile latency	decay_geo_gauss_script_score	450.7542979	389.7544834	60.99981453	ms
100th percentile latency	decay_geo_gauss_script_score	538.551451	395.75293	142.798521	ms
50th percentile service time	decay_geo_gauss_script_score	388.0335405	378.8137045	9.219835999	ms
90th percentile service time	decay_geo_gauss_script_score	403.9975599	382.6389076	21.3586523	ms
99th percentile service time	decay_geo_gauss_script_score	450.1032284	389.1097136	60.99351485	ms
100th percentile service time	decay_geo_gauss_script_score	537.919936	395.100654	142.819282	ms
error rate	decay_geo_gauss_script_score	0	0	0	%

Metric	Task	Baseline	Contender	Diff	Unit
Min Throughput	field_value_function_score	1.5	1.5	0	ops/s
Median Throughput	field_value_function_score	1.5	1.5	0	ops/s
Max Throughput	field_value_function_score	1.51	1.51	0	ops/s
50th percentile latency	field_value_function_score	147.6084107	142.4418055	5.166605167	ms
90th percentile latency	field_value_function_score	161.4163745	146.0292471	15.38712737	ms
99th percentile latency	field_value_function_score	218.4858815	149.4448299	69.04105157	ms
100th percentile latency	field_value_function_score	223.5476993	154.4188467	69.12885263	ms
50th percentile service time	field_value_function_score	147.071556	141.8792295	5.1923265	ms
90th percentile service time	field_value_function_score	160.8855899	145.4722711	15.4133188	ms
99th percentile service time	field_value_function_score	217.9465422	148.8731825	69.07335967	ms
100th percentile service time	field_value_function_score	223.080105	153.87006	69.210045	ms
error rate	field_value_function_score	0	0	0	%
Min Throughput	field_value_script_score	1.5	1.5	0	ops/s
Median Throughput	field_value_script_score	1.5	1.5	0	ops/s

Metric	Task	Baseline	Contender	Diff	Unit
Max Throughput	field_value_script_score	1.51	1.51	0	ops/s
50th percentile latency	field_value_script_score	208.4922433	200.310233	8.182010333	ms
90th percentile latency	field_value_script_score	213.0348423	206.2690364	6.765805933	ms
99th percentile latency	field_value_script_score	256.5748294	216.7453505	39.82947894	ms
100th percentile latency	field_value_script_score	274.4188643	252.6694313	21.74943303	ms
50th percentile service time	field_value_script_score	208.058553	199.886616	8.171937	ms
90th percentile service time	field_value_script_score	212.5744289	205.7897592	6.784669699	ms
99th percentile service time	field_value_script_score	256.1503058	216.2602712	39.89003456	ms
100th percentile service time	field_value_script_score	274.185904	252.180659	22.005245	ms
error rate	field_value_script_score	0	0	0	%
Min Throughput	random_function_score	1.5	1.5	0	ops/s
Median Throughput	random_function_score	1.5	1.5	0	ops/s
Max Throughput	random_function_score	1.5	1.5	0	ops/s
50th percentile latency	random_function_score	244.4104887	242.6018717	1.808616967	ms
90th percentile latency	random_function_score	257.7793149	251.1366288	6.642686066	ms
99th percentile latency	random_function_score	323.8163443	290.9842466	32.83209765	ms
100th percentile latency	random_function_score	376.470245	307.5584597	68.9117853	ms

Metric	Task	Baseline	Contender	Diff	Unit
50th percentile service time	random_function_score	243.9546325	242.149128	1.8055045	ms
90th percentile service time	random_function_score	257.3440943	250.6830153	6.661078999	ms
99th percentile service time	random_function_score	323.3741708	290.5378949	32.83627594	ms
100th percentile service time	random_function_score	376.091853	307.111375	68.980478	ms
error rate	random_function_score	0	0	0	%
Min Throughput	random_script_score	1.5	1.5	0	ops/s
Median Throughput	random_script_score	1.5	1.5	0	ops/s
Max Throughput	random_script_score	1.5	1.5	0	ops/s
50th percentile latency	random_script_score	265.276135	258.3288777	6.947257301	ms
90th percentile latency	random_script_score	276.8986875	262.5996219	14.29906557	ms
99th percentile latency	random_script_score	327.6141767	276.7350459	50.87913078	ms
100th percentile latency	random_script_score	339.1401533	278.8234443	60.31670903	ms
50th percentile service time	random_script_score	264.845466	257.8902625	6.9552035	ms
90th percentile service time	random_script_score	276.4729421	262.1680452	14.3048969	ms
99th percentile service time	random_script_score	327.2584587	276.3056912	50.95276753	ms
100th percentile service time	random_script_score	338.704812	278.384714	60.320098	ms
error rate	random_script_score	0	0	0	%

Metric	Task	Baseline	Contender	Diff	Unit
Min Throughput	large_terms	1.5	1.5	0	ops/s
Median Throughput	large_terms	1.5	1.5	0	ops/s
Max Throughput	large_terms	1.5	1.5	0	ops/s
50th percentile latency	large_terms	474.347426	429.023917	45.323509	ms
90th percentile latency	large_terms	482.346874	438.5573247	43.7895493	ms
99th percentile latency	large_terms	521.4118005	468.2661402	53.14566029	ms
100th percentile latency	large_terms	529.6919453	494.4412297	35.25071563	ms
50th percentile service time	large_terms	474.1270145	428.772941	45.3540735	ms
90th percentile service time	large_terms	482.1388748	438.29435	43.8445248	ms
99th percentile service time	large_terms	521.2451771	468.0068679	53.23830923	ms
100th percentile service time	large_terms	529.479614	494.168992	35.310622	ms
error rate	large_terms	0	0	0	%
Min Throughput	large_filtered_terms	1.5	1.5	0	ops/s
Median Throughput	large_filtered_terms	1.5	1.5	0	ops/s
Max Throughput	large_filtered_terms	1.5	1.5	0	ops/s
50th percentile latency	large_filtered_terms	475.7995187	433.0397738	42.75974487	ms
90th percentile latency	large_filtered_terms	486.3646669	443.241508	43.1231589	ms
99th percentile latency	large_filtered_terms	565.6174992	460.8045067	104.8129925	ms

Metric	Task	Baseline	Contender	Diff	Unit
100th percentile latency	large_filtered_terms	585.669044	486.396965	99.272079	ms
50th percentile service time	large_filtered_terms	475.580755	432.780252	42.8005025	ms
90th percentile service time	large_filtered_terms	486.1421912	442.9739873	43.1682039	ms
99th percentile service time	large_filtered_terms	565.483224	460.7444745	104.7387495	ms
100th percentile service time	large_filtered_terms	585.452311	486.145846	99.306465	ms
error rate	large_filtered_terms	0	0	0	%
Min Throughput	large_prohibited_terms	1.5	1.5	0	ops/s
Median Throughput	large_prohibited_terms	1.5	1.5	0	ops/s
Max Throughput	large_prohibited_terms	1.5	1.5	0	ops/s
50th percentile latency	large_prohibited_terms	474.8867557	430.1467708	44.73998487	ms
90th percentile latency	large_prohibited_terms	483.007269	436.8730103	46.13425867	ms
99th percentile latency	large_prohibited_terms	540.355679	484.5697929	55.78588612	ms
100th percentile latency	large_prohibited_terms	574.8374467	492.75088	82.08656667	ms
50th percentile service time	large_prohibited_terms	474.6650815	429.8833325	44.781749	ms
90th percentile service time	large_prohibited_terms	482.7923966	436.6196592	46.1727374	ms
99th percentile service time	large_prohibited_terms	540.1352455	484.3087876	55.82645786	ms
100th percentile service time	large_prohibited_terms	574.674312	492.492977	82.181335	ms

Metric	Task	Baseline	Contender	Diff	Unit
error rate	large_prohibited_terms	0	0	0	%
Min Throughput	desc_sort_population	1.5	1.5	0	ops/s
Median Throughput	desc_sort_population	1.51	1.51	0	ops/s
Max Throughput	desc_sort_population	1.51	1.51	0	ops/s
50th percentile latency	desc_sort_population	49.97947483	45.9402765	4.039198334	ms
90th percentile latency	desc_sort_population	52.97220567	49.01190953	3.960296137	ms
99th percentile latency	desc_sort_population	65.81446927	58.5120831	7.30238617	ms
100th percentile latency	desc_sort_population	68.243857	60.027354	8.216503	ms
50th percentile service time	desc_sort_population	49.3373975	45.2962825	4.041115	ms
90th percentile service time	desc_sort_population	52.3443909	48.3757462	3.968644701	ms
99th percentile service time	desc_sort_population	65.17446437	57.86711494	7.307349431	ms
100th percentile service time	desc_sort_population	67.595051	59.377354	8.217697001	ms
error rate	desc_sort_population	0	0	0	%
Min Throughput	asc_sort_population	1.5	1.5	0	ops/s
Median Throughput	asc_sort_population	1.51	1.51	0	ops/s
Max Throughput	asc_sort_population	1.51	1.51	0	ops/s
50th percentile latency	asc_sort_population	50.29814734	46.02105783	4.277089506	ms
90th percentile latency	asc_sort_population	54.12596357	48.79212977	5.333833798	ms

Metric	Task	Baseline	Contender	Diff	Unit
99th percentile latency	asc_sort_population	57.9221302	55.94577758	1.976352622	ms
100th percentile latency	asc_sort_population	69.35533	72.898199	-3.542868999	ms
50th percentile service time	asc_sort_population	49.667352	45.37886	4.288492001	ms
90th percentile service time	asc_sort_population	53.4878858	48.1426418	5.345244	ms
99th percentile service time	asc_sort_population	57.2779194	55.30153109	1.976388311	ms
100th percentile service time	asc_sort_population	68.714241	72.260339	-3.546097999	ms
error rate	asc_sort_population	0	0	0	%
Min Throughput	desc_sort_geonameid	1.5	1.5	0	ops/s
Median Throughput	desc_sort_geonameid	1.51	1.51	0	ops/s
Max Throughput	desc_sort_geonameid	1.51	1.51	0	ops/s
50th percentile latency	desc_sort_geonameid	49.2601545	52.22274167	-2.96258717	ms
90th percentile latency	desc_sort_geonameid	53.48767223	69.4325779	-15.94490567	ms
99th percentile latency	desc_sort_geonameid	69.43293772	79.57920996	-10.14627224	ms
100th percentile latency	desc_sort_geonameid	72.512932	80.11872267	-7.60579067	ms
50th percentile service time	desc_sort_geonameid	48.6107425	51.6055115	-2.994769001	ms
90th percentile service time	desc_sort_geonameid	52.839748	68.801679	-15.961931	ms
99th percentile service time	desc_sort_geonameid	68.79282147	79.41158055	-10.61875908	ms

Metric	Task	Baseline	Contender	Diff	Unit
100th percentile service time	desc_sort_geonameid	71.872758	79.465491	-7.592732999	ms
error rate	desc_sort_geonameid	0	0	0	%
Min Throughput	asc_sort_geonameid	1.5	1.5	0	ops/s
Median Throughput	asc_sort_geonameid	1.51	1.51	0	ops/s
Max Throughput	asc_sort_geonameid	1.51	1.51	0	ops/s
50th percentile latency	asc_sort_geonameid	47.071104	51.35154333	-4.280439331	ms
90th percentile latency	asc_sort_geonameid	50.264151	52.2966503	-2.0324993	ms
99th percentile latency	asc_sort_geonameid	57.9888054	55.33079961	2.658005793	ms
100th percentile latency	asc_sort_geonameid	96.39665433	55.520544	40.87611033	ms
50th percentile service time	asc_sort_geonameid	46.427649	50.7138335	-4.286184501	ms
90th percentile service time	asc_sort_geonameid	49.6192723	51.6588923	-2.039619999	ms
99th percentile service time	asc_sort_geonameid	57.75922607	54.68967127	3.069554799	ms
100th percentile service time	asc_sort_geonameid	95.751176	54.874135	40.877041	ms
error rate	asc_sort_geonameid	0	0	0	%

12 配额说明

本服务应用的资源类型如下：

- 实例数
- CPU数量
- 内存数量(GB)
- 磁盘数
- 磁盘容量(GB)

其配额查看及修改请参见**关于配额**。

13 与其他服务之间的关系

CSS与其他服务的关系如图13-1所示。

图 13-1 CSS 与其他服务的关系

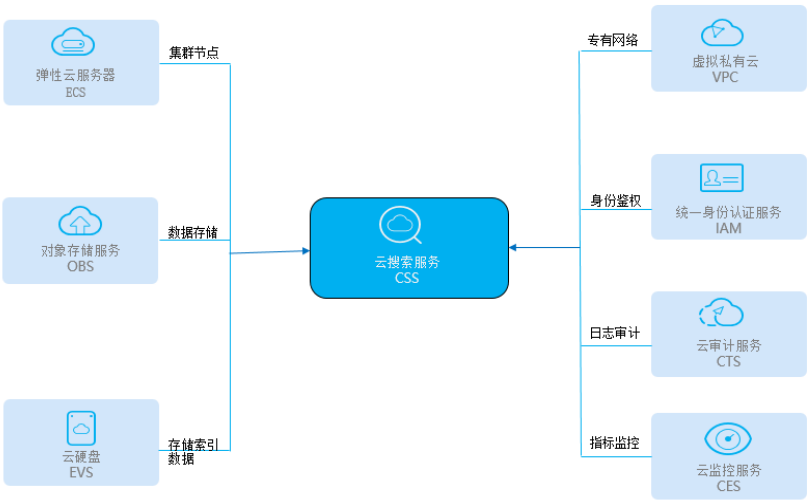


表 13-1 CSS 服务于其他服务的关系

相关服务	交互功能
虚拟私有云（Virtual Private Cloud，简称VPC）	云搜索服务CSS的集群创建在虚拟私有云（VPC）的子网内，VPC通过逻辑方式进行网络隔离，为用户的集群提供安全、隔离的网络环境。详细请参考虚拟私有云用户指南。
弹性云服务器（Elastic Cloud Server，简称ECS）	云搜索服务CSS的集群中每个节点为一台弹性云服务器（ECS）。创建集群时将自动创建弹性云服务器作为节点。
云硬盘（Elastic Volume Service，简称EVS）	云搜索服务CSS使用云硬盘（EVS）存储索引数据。创建集群时，将自动创建云硬盘用于集群存储。

相关服务	交互功能
对象存储服务（Object Storage Service，简称OBS）	云搜索服务CSS的集群快照存储在对象存储服务（OBS）的桶中。详细请参考**对象存储服务用户指南**。
统一身份认证服务（Identity and Access Management，简称IAM）	云搜索服务CSS使用统一身份认证服务（IAM）进行鉴权。详细请参考**统一身份认证服务用户指南**。
云监控服务（Cloud Eye）	云搜索服务使用云监控服务实时监测集群的指标信息，保障服务正常运行。云搜索服务当前支持的监控指标为磁盘使用率和集群健康状态。用户通过磁盘使用率指标可以及时了解集群的磁盘使用情况。通过集群健康状态指标，用户可以了解集群的健康状态。详细请参考**云监控服务用户指南**。
云审计服务（Cloud Trace Service，简称CTS）	云审计服务（CTS）可以记录与CSS云搜索服务相关的操作事件，便于日后的查询、审计和回溯。详细请参考**云审计服务用户指南**。

14 基本概念

集群

云搜索服务是以集群为单位进行组织，一个集群代表一个独立运行的搜索服务，由多个节点构成。

索引

用于存储Elasticsearch的数据，是一个或多个分片分组在一起的逻辑空间。

Shard

索引可以存储数据量超过1个节点硬件限制的数据。为满足这样的需求，Elasticsearch提供了一个能力，将一个索引拆分为多个，称为Shard。当您创建一个索引时，您可以根据实际情况指定Shard的数量。每个Shard托管在集群中的任意一个节点中，且每个Shard本身是一个独立的、全功能的“索引”。

Shard的数量只能在创建索引前指定，且在索引创建成功后无法修改。

Replica（副本）

Shard下的实际存储索引的一个副本。可以理解为备份Shard。副本的存在可以预防单节点故障。使用过程中，您可以根据业务情况增加或减少Replica数量。

文档

Elasticsearch存储的实体，是可以被索引的基本单位，相当于关系型数据库中的行。

文档类型

类似关系型数据库中的表，用于区分不同的数据。

Elasticsearch 7.x以下版本中，1个索引里面可以包含若干个文档类型，每个文档必须设定它的文档类型。

Elasticsearch 7.x及以上版本中，文档类型只支持“_doc”。

映射

用来约束字段的类型，可以根据数据自动创建。相当于数据库中的Schema。

字段

组成文档的最小单位。相当于数据库中的Column。

15 修订记录

发布时间	修改说明
2023-12-26	更新**应用场景**
2023-08-29	• 下线计费说明 • **权限管理**更新CSS系统权限依赖关系
2023-05-29	补充增强特性说明：**产品优势**
2023-05-29	新增**产品规格**
2023-03-27	补充性能指标的参考说明：**性能说明**
2023-02-02	基于用户体验，整改产品介绍大纲。
2022-11-15	下线折扣套餐包：计费说明
2022-10-30	新增安全特性文档：**安全**
2022-06-30	• 新增Elasticsearch 7.10.2版本，下线Elasticsearch 7.9.3版本。 • 内容优化：**权限管理**
2022-06-09	新增安全公告：**云搜索服务关于Apache log4j远程代码执行漏洞（CVE-2021-44228）的公告**
2022-04-02	新增向量检索的应用场景。
2021-10-12	下线Logstash类型集群
2021-03-02	新增Logstash类型集群
2021-01-30	新增7.9.3版本
2020-08-25	支持细粒度授权：**权限管理**
2020-04-16	修改性能说明数据：**性能说明**
2019-09-12	新增Cerebro的介绍。
2019-04-30	第一次正式发布。