Preparing to Install Elasticsearch

By default, Liferay DXP 7.0 and its embedded Elasticsearch engine run in the same JVM. Although this enables out-of-the-box search in Liferay DXP 7.0, it's only supported for development; production use isn't supported. For production use, Liferay only supports Elasticsearch when it runs in a separate JVM, because search engines benefit heavily from caching. This makes their JVM memory profiles differ substantially from those of a JVM running Liferay DXP 7.0. Therefore, the two applications should always be kept separate in production environments.

The following sections provide a synopsis of Elasticsearch configurations for Liferay DXP 7.0. Prior to deployment, we strongly recommend reading Elastic's documentation on production deployment.

Sizing Your Deployment

When sizing your Elasticsearch deployment, you must carefully consider your CPU, memory, disk, and network capacity. Generally, you should deploy Elasticsearch on medium to large machines. This lets you scale effectively and avoid large numbers of machines. You should also avoid running multiple Elasticsearch JVMs on the same operating system.

CPU

Liferay recommends that you allocate at least 4 CPU cores to the Elasticsearch engine. This assumes only 1 Elasticsearch JVM running on the machine.

Memory

Liferay recommends at least 16 GB of memory for JVM heap settings (xmx, xms, for example), with 64 GB preferred. The memory allocation depends upon the amount of index data. For index sizes 500 GB to 1 TB, 64 GB of heap memory allocation for Elasticsearch should suffice.

Disk

traditional hard disks (e.g., 15k RPM). Consider using RAID 0 for both SSD and traditional hard disks.

In general, avoid using NAS (network attached storage) for Elasticsearch as the network overhead can be large. If you're using public cloud infrastructure like Amazon Web Services, use instance local storage and avoid network storage like Elastic Block Store (EBS).

Also note that search index sizes vary based on the indexed content. Ensure you have at least 25% more disk capacity than the total size of your indexes. For example, if your index is 50 GB, you should have at least 75 GB of disk space available. To estimate the disk space you need, Liferay recommends that you index a representative sample of your production content and then multiply the size of that sample index by the fraction of your production content that it represents. For example, index 25% of your production content and then multiply the resulting index size by 4. Keep in mind that indexing a 1 MB file doesn't result in 1 MB of space in the search index.

Networking

Elasticsearch relies on clustering and sharding to deliver fast, accurate search results. Therefore, it requires a fast and reliable network. Most modern data centers provide 1 GbE or 10 GbE between machines. Avoid spreading Elasticsearch clusters across multiple data centers. Elasticsearch doesn't support multi-data center deployments, especially data centers spread across large distances (e.g., cross-continent). To support multi-data center deployments, you must create a custom solution that distributes index requests (update, delete, add document) to each data center.

Shards and Replicas

Elasticsearch uses shards and replicas to scale. Shards divide a search index into smaller, more manageable chunks. For example, if you have a 500 GB index you can split it into 10 shards of 50 GB each. For best results, each shard shouldn't exceed 50 GB. More shards generally mean faster indexing (write) performance but slower search (read) performance. In Elasticsearch, an index with multiple shards results in a distributed search and a subsequent result merge. Replicas provide resiliency and improve search performance. A replica helps to load balance search operations across the cluster.

« Introduction to Liferay Enterprise Search Configuring Elasticsearch »

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