

The logo for Gdevops, featuring a stylized orange 'G' followed by the word 'devops' in white lowercase letters. The background is blue with white geometric lines forming triangles and circles, and some network-like patterns in the corners.

Gdevops

全球敏捷运维峰会

携程机票Elasticsearch集群驯服记

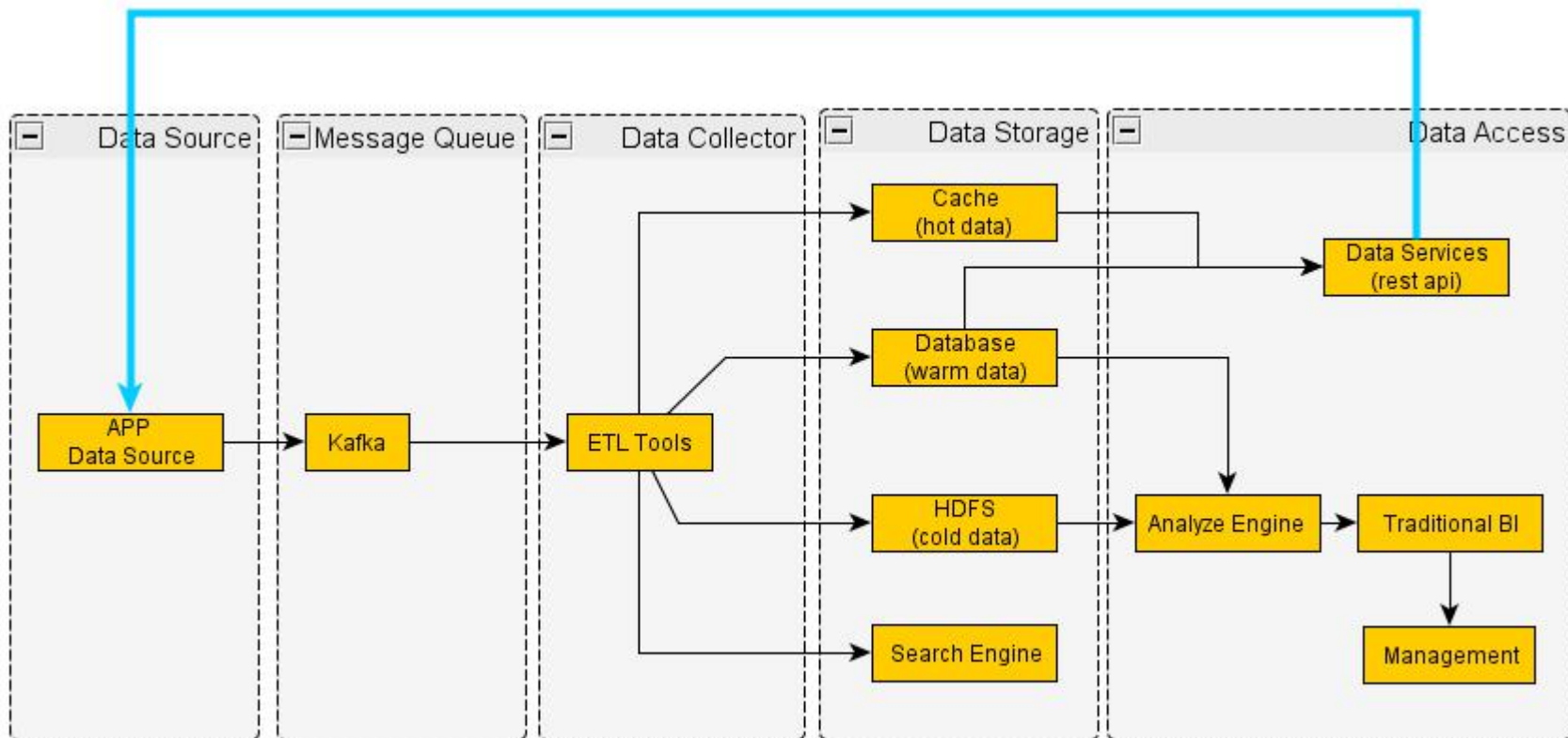
演讲人：许鹏



目录

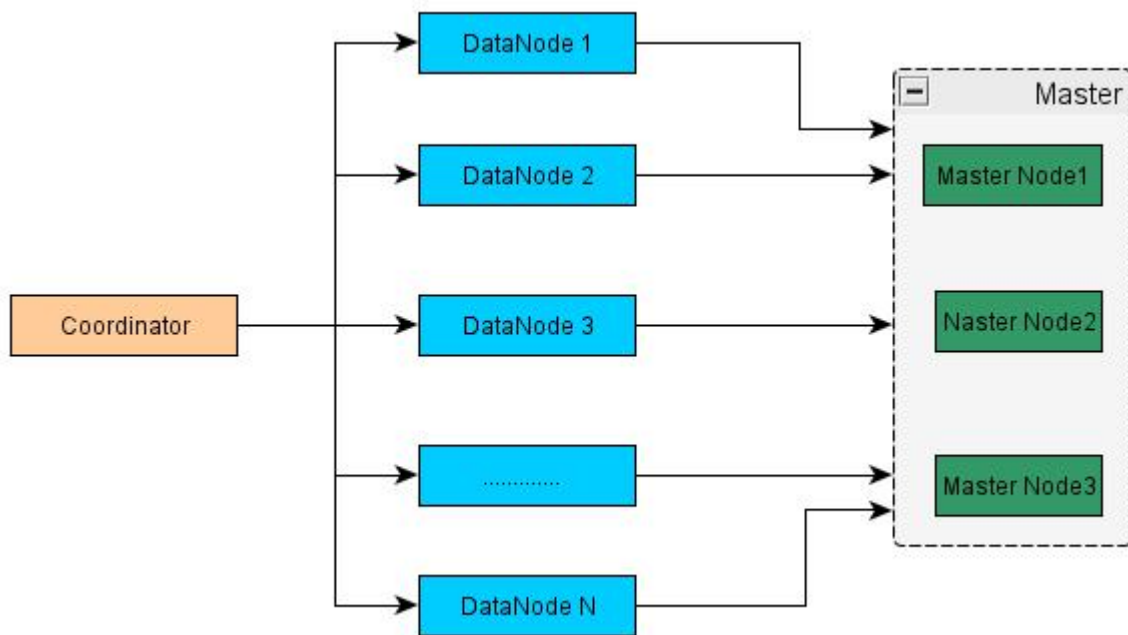
- 集群规划
- 集群设置
- 集群监控

整体架构



集群规划

- Coordinator Node
 - 协调节点
 - 不进行数据存储
- Master Node
 - 集群节点信息
 - 索引元信息
- Data Node
 - 数据存储节点





PART II 集群配置



OS参数设置 - 内存相关

- ***/etc/security/limits.conf***

- * hard memlock unlimited
- * soft memlock unlimited
- * - nofile 65535

- 确保***/etc/pam.d/login***文件中有如下内容

session required /lib/security/pam_limits.so

- ***max_map_count***定义了进程能拥有的最多内存区域

```
sysctl -w vm.max_map_count=262144
```

OS参数设置 - IO相关

1. /etc/fstab

```
/dev/sda1      /opt/data/1      ext4 defaults,noatime,nodiratime 0 0  
/dev/sdb1      /opt/data/2      ext4 defaults,noatime,nodiratime 0 0
```

noatime, nodiratime避免每次数据访问的时候都更新access time信息

2. 设置 vm.dirty_ratio和vm.dirty_background_ratio

```
sysctl -w vm.dirty_ratio=10  
sysctl -w vm.dirty_background_ratio=5
```

3. 设置swap

```
sudo sh -c 'echo "1">/proc/sys/vm/swappiness'
```

Elasticsearch参数设置 – JVM设置

1. /etc/elasticsearch/jvm.options

-Xms32g

-Xmx32g

-XX:+ExitOnOutOfMemoryError

2. /etc/elasticsearch/elasticsearch.yml

bootstrap.memory_lock: true

bootstrap.system_call_filter: false

Elasticsearch 参数设置

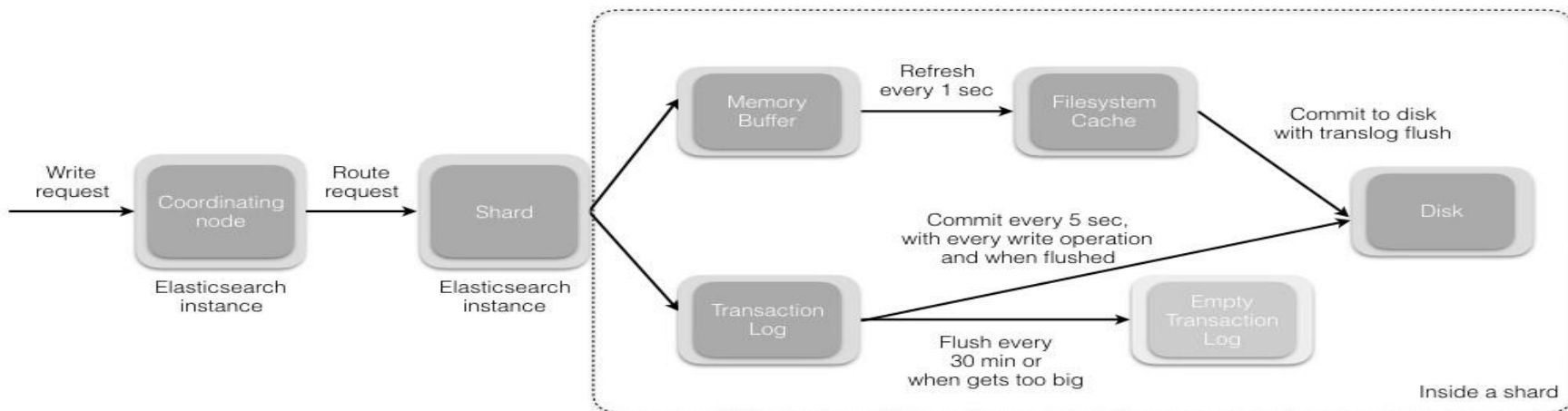
- Shard 均匀分布
- Recovery

PUT _cluster/settings

```
{
  "transient": {
    "cluster": {
      "routing": {
        "allocation": {
          ""cluster_concurrent_rebalance": "4",
          ""node_concurrent_recoveries": "2",
          "exclude": {
            "_name": "",
            "_ip": "192.168.0.111"
          }
        }
      },
      "balance": {
        "index": "2.0f",
        "shard": "0.2f"
      }
    },
    "enable": "all"
  }
}
```

	shop_de_v1 shards: 5 * 3 docs: 169119 size: 54.59MB	shop_nl_v1 shards: 5 * 3 docs: 131858 size: 33.57MB	shop_pl_v1 shards: 5 * 3 docs: 130089 size: 37.16MB
★ spielwiese index: [redacted] load: 0.00 heap: 222.97MB/332.25MB	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
☆ nl-1 index: [redacted] load: 0.00 heap: 1.52GB/7.97GB	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
☆ PL-1 index: [redacted] load: 0.00 heap: 95.27MB/3.98GB	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
🔔 unassigned shards			

索引参数设置



名称	推荐值	
index.routing.allocation.total_shards_per_node	3	
index.refresh_interval	15s	
index.number_of_shards	12	
index.number_of_replicas	1	
index.store.type	mmapfs	
index.translog.flush_threshold_size	2g	
index.merge.scheduler.max_thread_count	1	

索引 Mapping 设置

Dynamic Mapping	<pre>"dynamic_templates": [{ "string_template": { "match_mapping_type": "string", "mapping": { "ignore_above": "10915", "type": "keyword" } }]</pre>
Object	<pre>{ "field_name": { "type": "object", "enabled": false } }</pre>

统一调用接口

- 不直接开放Elasticsearch的查询，而是通过开发的rest api来支持
 - 可以对所有的查询进行监控
 - 降低学习曲线
 - Elasticsearch-SQL



Part III 集群监控

监控内容

- OS层面

- 内存
- CPU

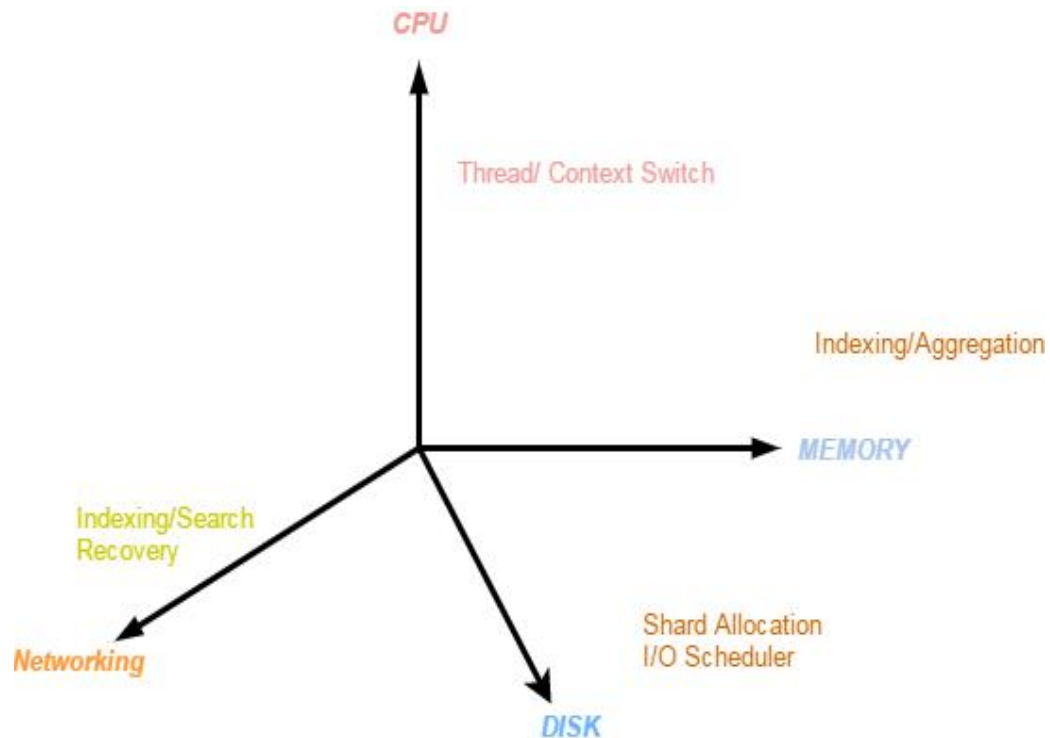
- 索引层面

- Shard
- Field Data
- 占用内存

	监控	
索引	Shard数	
	Shard分布均匀	
	是否存在大量查询	
	避免mapping中字段过多，引起mapping的频繁更新	
	聚合操作常易引起OOM	

监控工具

- elasticsearch.log
 - 节点退出
 - 内存溢出
- /var/log/messages
 - 网络错误
 - 硬件故障
- 多用_cat api
- X-Pack
- Eyeones
 - <https://github.com/hseagle/eyeones>

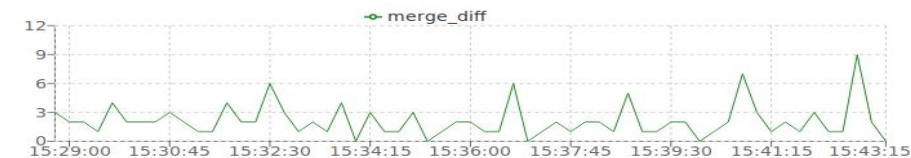
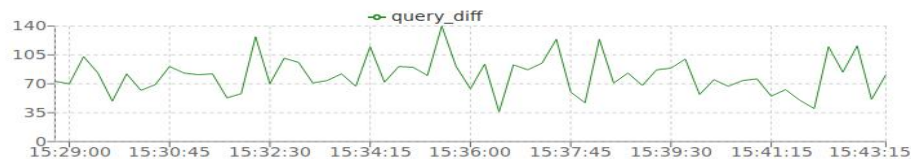
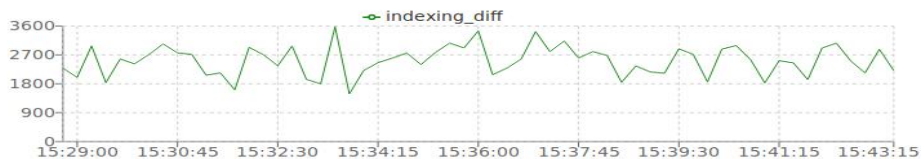
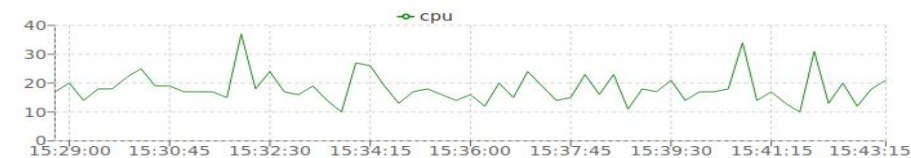
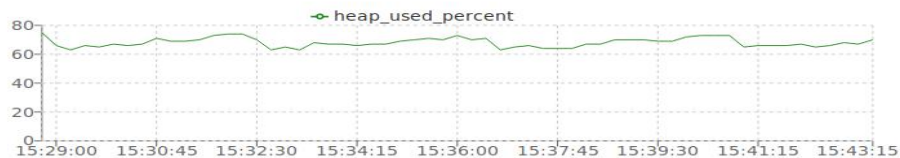


监控内容 -- 集群和节点



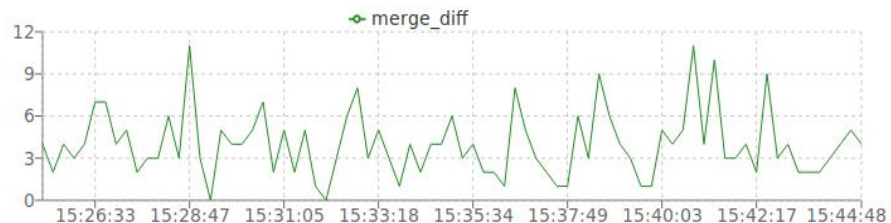
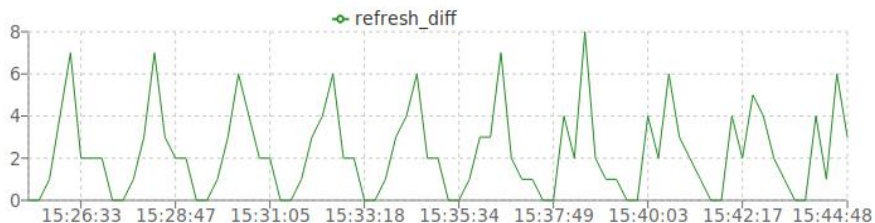
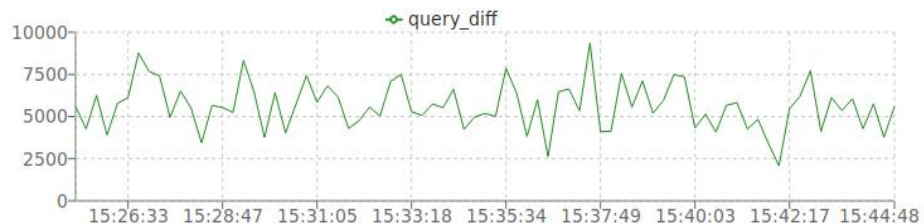
Search

name	load_5m ▾	heap_used_percen...	cpu ▾	ip ▾	index ▾	query ▾	shard_num...	available_d...	fielddata ▾
	18.4	74	14		4126	122	534	37TB	77MB
	17.88	67	31		2415	107	535	17TB	67MB
	16.86	72	38		3057	102	535	14TB	52MB
	16.53	74	25		3306	107	535	19TB	69MB



监控内容 - 索引状态

name	index ▾	query ▾	docs ▾	refresh ▾	merge ▾	shard_num ▾	size ▾
[redacted]	9644	404	333414432	0	2	18	456GB
[redacted]	7707	302	139848074	1	0	36	450GB
[redacted]	6149	16	148835435	5	1	18	574GB
[redacted]	4127	0	196980906	0	0	24	23GB
[redacted]	2366	0	173676105	0	3	18	250GB
[redacted]	1409	0	63426570	1	1	12	273GB



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THANK YOU !