01_设计与使用文档
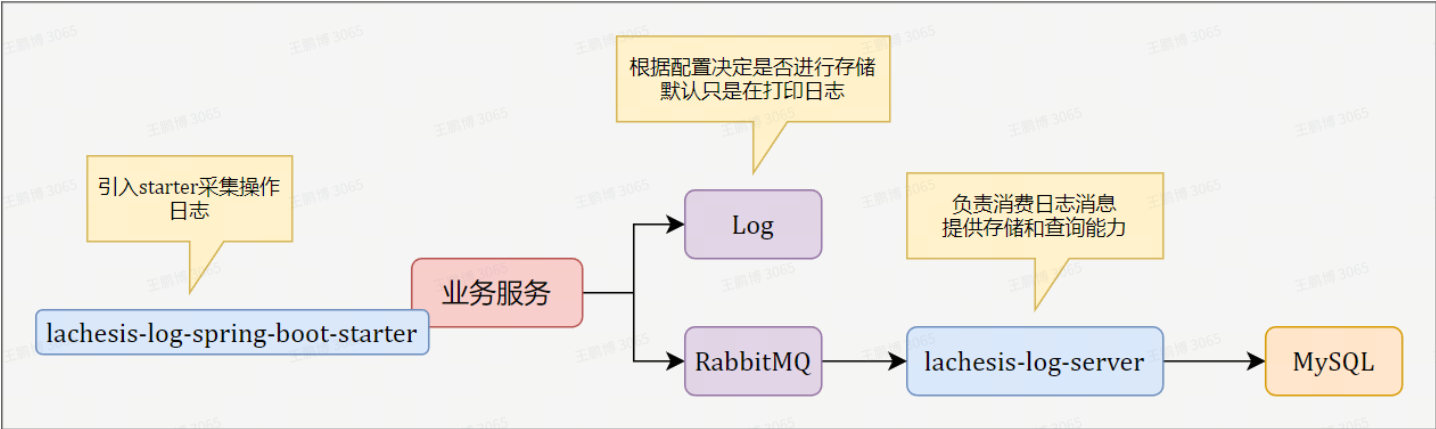
概述

操作记录采集流程

快速使用

引入依赖

```xml
1  <dependency>
2      <groupId>com.lachesis</groupId>
3      <artifactId>lachesis-log-spring-boot-starter</artifactId>
4      <version>1.1-SNAPSHOT</version>
5  </dependency>
```

概念与注解

操作记录目前分为两大类，一类为EntryLog，一类为ExitLog。目前基于这两类存在三个注解，以应对不同的场景。详细说明见下。

- EntryLog：其定义为主操作记录。
- ExitLog：其定义为主操作过程中关联的子操作记录。

注解	分类	说明
@LachesisEntryLog	EntryLog	主操作记录注解
@LachesisOpDataExitLog	ExitLog	变更数据子操作记录注解
@LachesisCommonExitLog	ExitLog	普通的子操作记录注解

注解说明

@LachesisEntryLog

```java
    主要作用是操作日志采集的入口，日志的采集可以没有ExitLog，但是必须存在EntryLog
@Target(ElementType.METHOD)
@Retention(RetentionPolicy.RUNTIME)
@Inherited
@Documented
public @interface LachesisEntryLog {

    业务模块
    String module() default "";
    操作名称，当前操作的简要描述
    String opName();
    操作员
    String operator() default "";
    操作内容
    String content() default "";
    日志记录条件，为true时才会记录，否则，不会
    String condition() default "true";
    当操作明细为空时是否进行处理，默认不做处理
    boolean ignoreEmptyContent() default true;
    访问者模式，方便业务方对框架生成的最终输出前的结果进行加工处理
    Class<? extends IEntryLogVisitor> visitor() default DefaultEntryLogVisitor.class;
    日志ID，用于串通一次操作的所有日志记录
    String logId() default "";

}
```

@LachesisOpDataExitLog

```java
  主要应对数据的增删改查操作的场景，比如数据库，RPC，缓存等等
@Target(ElementType.METHOD)
@Retention(RetentionPolicy.RUNTIME)
@Inherited
@Documented
public @interface LachesisDataOpExitLog {
    操作名称，当前操作的简要描述
  String opName();
    操作类型，目前仅支持增删改，对于查询还不支持
  OpType opType();
    当前操作数据的唯一标识，支持联合字段标识唯一性，使用英文逗号分割
  String id();
    当前操作的数据变更前的内容，有两种方式获取：1.直接设置字符串类型的数据；2.通过SPEL表达式获取
  String before() default "";
    当前操作的数据变更后的内容，有两种方式获取：1.直接设置字符串类型的数据；2.通过SPEL表达式获取
  String after() default "";
    通用结果中，排除属性名称数组
  String[] exclude() default {};
    日志记录条件，为true时才会记录，否则，不会
  String condition() default "true";
    访问者模式，方便业务方对框架生成的通用日志生成的增删改结果进一步加工处理
  Class<? extends IDataOpVisitor> visitor() default DefaultDataOpVisitor.class;
    所属主体，根据使用场景不同，填写的内容不一样，但是含义基本类似，表示当前操作的数据所属的主体
      1. 在MySQL操作场景下存储的是表名，即当前操作的数据所属的主体是某个表中的数据
      2. 在MongoDB操作场景下存储的是集合名称，即当前操作的数据所属的主体是某个集合中的数据

  String owner();
}
```

@LachesisCommonExitLog

```
主要应对于简单的日志记录场景
@Target(ElementType.METHOD)
@Retention(RetentionPolicy.RUNTIME)
@Inherited
@Documented
public @interface LachesisCommonExitLog {
    操作名称
    String opName();
    操作内容
    String content() default "";
    日志记录条件，为true时才会记录，否则，不会
    String condition() default "true";
}
```

具体的关联关系和区别，通过示例和设计理念来深入理解。

操作记录采集示例

为了快速上手操作记录框架接入和理解，通过举例说明目前支持的各个场景。

示例1.仅@LachesisEntryLog场景

在主操作添加@LachesisEntryLog注解：

```
1  @LachesisEntryLog(module = "测试",
2      opName = "测试仅有LachesisEntryLog时",
3      operator = "测试员",
4      logId = "1111111111111111")
5  @GetMapping("/test01")
6  public ResultMessage<String> test01() {
7      return ResultMessage.success("hello");
```

```
8    }
```

触发方法调用后，根据默认策略产生的日志内容如下：

```
1    {
2        "attachments": {},
3        "module": "测试",
4        "operator": "测试员",
5        "content": "测试操作内容",
6        "isError": false,
7        "opName": "测试仅有LachesisEntryLog时",
8        "startTime": 1702618040020,
9        "logId": "1111111111111111",
10       "endTime": 1702618040024
11   }
```

示例2.@LachesisEntryLog+@LachesisCommonExitLog场景

暂时不考虑此场景，理论上是支持的，后续有场景使用时，再做补充~

示例3.@LachesisEntryLog+@LachesisOpDataExitLog场景

增

在主操作添加@LachesisEntryLog注解：

```
1    @LachesisEntryLog(opName = "保存/更新护理评估数据",
2        operator = "
{@orderUtils.getUserNameByCode(@valueBeanStamp.getUserCodeInConext())}",
3        visitor = DocDataEvaluateRecordEntryLogVisitor.class,
4        logId = "{T(com.yomahub.tlog.context.TLogContext).getTraceId()}")
5    @Transactional(propagation = Propagation.REQUIRED, rollbackFor =
Exception.class)
6    @Override
7    public DocDataEvaluateRisk saveEvaluateRecord(DocDataEvaluateRecordDTO
evaluateData) {
8        // ...
```

```
9    }
```

在子操作添加@LachesisOpDataExitLog注解：

```
1  @LachesisDataOpExitLog(opName = "新增护理评估单主表信息",
2      id = "seqId",
3      opType = OpType.CREATE,
4      before = "{selectByPrimaryKey(#a0.seqId)}",
5      after = "{#a0}",
6      visitor = DocDataNurseRecordDataOpExitLogVisitor.class,
7      owner = EVALUATE_RECORD_TABLE)
8  Long insertAndReturnKey(DocDataEvaluateRecord record);
```

触发方法调用后，根据默认策略产生的操作记录日志内容如下：

```
1   {
2       "attachments": {
3           "patName": "庞小萍",
4           "bedNo": "21201"
5       },
6       "module": "zsg-测试动作属性-评估单",
7       "operator": "李",
8       "content": "新增列(目标多选)[];新增列(多选项选中)[];新增列(单选项选中)[1-10分选
中];新增列(选中赋值)[];新增列(文本框赋值)[];新增列(11-20分选中)[];新增列(时间)
[17:55];新增列(总分)[0];新增列(21-30分选中)[];新增列(风险等级)[];新增列(多选项算分用)
[];新增列(日期)[2023-12-15]",
9       "isError": false,
10      "opName": "保存/更新护理评估数据",
11      "startTime": 1702634167540,
12      "logId": "13871229659971649",
13      "endTime": 1702634168480
14  }
```

注意：这里的content并不是我们设置的，而是由业务端根据框架生成的明细和实际的业务需求生成的。

如何生成？全靠@LachesisEntryLog和@LachesisOpDataExitLog中的visitor实现。

- 顾名思义，这里设想的是通过 访问者模式 ，提供各个业务对中间生成的数据可以访问，并添加自己需要的附件内容至attachments属性中。

- 注意：在访问中间数据时，严格意义上不允许修改的，仅允许新增业务需要的数据至attachments属性中。
- 具体怎么拓展使用，可以参考mnis的中的实现。

在业务进行开发时，可能需要得知中间的明细数据，需要将 *lachesislog.log-enable=true* 开启，就会看到一些明细：

中间明细

展开源码

```
{
    "dataOpExitLogs": [
        {
            "owner": "doc_data_evaluate_record",
            "attachments": {},
            "records": [
                {
                    "attachments": {},
                    "opType": "CREATE",
                    "pValue": "1982122032",
                    "id": "seqId",
                    "fields": [
                        {
                            "name": "documentCode",
                            "after": "D00329062"
                        },
                        {
                            "name": "patCode",
                            "after": "1186512"
                        },
                        {
                            "name": "templateName",
                            "after": "zsg-测试动作属性-评估单"
                        },
                        {
                            "name": "createTime",
                            "after": 1702634167773
                        },
                        {
                            "name": "createPerson",
                            "after": "123"
                        },
```

```
33                              {
34                                  "name": "recordDate",
35                                  "after": 1702634100000
36                              },
37                              {
38                                  "name": "templateCode",
39                                  "after": "T001134"
40                              },
41                              {
42                                  "name": "wardCode",
43                                  "after": "310"
44                              },
45                              {
46                                  "name": "recordCode",
47                                  "after": "1735599610895929344-90992"
48                              },
49                              {
50                                  "name": "inhosCode",
51                                  "after": "22410518"
52                              },
53                              {
54                                  "name": "seqId",
55                                  "after": 1982122032
56                              },
57                              {
58                                  "name": "primaryKey",
59                                  "after": 1982122032
60                              }
61                          ]
62                      }
63                  ],
64              "opType": "CREATE",
65              "isError": false,
66              "opName": "新增护理评估单主表信息",
67              "startTime": 1702634167836,
68              "id": "seqId",
69              "endTime": 1702634168061
70          },
71          {
72              "owner": "doc_data_evaluate_record_detail",
73              "attachments": {},
74              "records": [
75                  {
76                      "attachments": {
77                          "itemValueAfter": "",
78                          "itemCode": "P00019902",
79                          "itemName": "文本框赋值",
```

```json
 80                        "recordCode": "1735599610895929344-90992"
 81                    },
 82                "opType": "CREATE",
 83                "id": "recordCode,inhosCode,itemCode",
 84                "fields": [
 85                        {
 86                            "name": "itemValue",
 87                            "after": ""
 88                        }
 89                    ]
 90            },
 91            {
 92                "attachments": {
 93                    "itemValueAfter": "",
 94                    "itemCode": "P00019853",
 95                    "itemName": "21-30分选中",
 96                    "recordCode": "1735599610895929344-90992"
 97                },
 98                "opType": "CREATE",
 99                "id": "recordCode,inhosCode,itemCode",
100                "fields": [
101                        {
102                            "name": "itemValue",
103                            "after": ""
104                        }
105                    ]
106            },
107            {
108                "attachments": {
109                    "itemValueAfter": "",
110                    "itemCode": "P00019864",
111                    "itemName": "风险等级",
112                    "recordCode": "1735599610895929344-90992"
113                },
114                "opType": "CREATE",
115                "id": "recordCode,inhosCode,itemCode",
116                "fields": [
117                        {
118                            "name": "itemValue",
119                            "after": ""
120                        }
121                    ]
122            },
123            {
124                "attachments": {
125                    "itemValueAfter": "",
126                    "itemCode": "P00019854",
```

```json
                            "itemName": "多选项算分用",
                            "recordCode": "1735599610895929344-90992"
                        },
                    "opType": "CREATE",
                    "id": "recordCode,inhosCode,itemCode",
                    "fields": [
                            {
                                "name": "itemValue",
                                "after": ""
                            }
                        ]
                },
                {
                    "attachments": {
                        "itemValueAfter": "",
                        "itemCode": "P00019851",
                        "itemName": "11-20分选中",
                        "recordCode": "1735599610895929344-90992"
                    },
                    "opType": "CREATE",
                    "id": "recordCode,inhosCode,itemCode",
                    "fields": [
                            {
                                "name": "itemValue",
                                "after": ""
                            }
                        ]
                },
                {
                    "attachments": {
                        "itemValueAfter": "17:55",
                        "itemCode": "P00019884",
                        "itemName": "时间",
                        "recordCode": "1735599610895929344-90992"
                    },
                    "opType": "CREATE",
                    "id": "recordCode,inhosCode,itemCode",
                    "fields": [
                            {
                                "name": "itemValue",
                                "after": "17:55"
                            }
                        ]
                },
                {
                    "attachments": {
                        "itemValueAfter": "0",
```

```json
                    "itemCode": "P00019863",
                    "itemName": "总分",
                    "recordCode": "1735599610895929344-90992"
                },
                "opType": "CREATE",
                "id": "recordCode,inhosCode,itemCode",
                "fields": [
                    {
                        "name": "itemValue",
                        "after": "0"
                    }
                ]
            },
            {
                "attachments": {
                    "itemValueAfter": "1",
                    "itemCode": "P00019850",
                    "itemName": "1-10分选中",
                    "recordCode": "1735599610895929344-90992"
                },
                "opType": "CREATE",
                "id": "recordCode,inhosCode,itemCode",
                "fields": [
                    {
                        "name": "itemValue",
                        "after": "1"
                    }
                ]
            },
            {
                "attachments": {
                    "itemValueAfter": "2023-12-15",
                    "itemCode": "P00019883",
                    "itemName": "日期",
                    "recordCode": "1735599610895929344-90992"
                },
                "opType": "CREATE",
                "id": "recordCode,inhosCode,itemCode",
                "fields": [
                    {
                        "name": "itemValue",
                        "after": "2023-12-15"
                    }
                ]
            },
            {
                "attachments": {
```

```
221                    "itemValueAfter": "",
222                    "itemCode": "P00019917",
223                    "itemName": "选中赋值",
224                    "recordCode": "1735599610895929344-90992"
225                },
226                "opType": "CREATE",
227                "id": "recordCode,inhosCode,itemCode",
228                "fields": [
229                    {
230                        "name": "itemValue",
231                        "after": ""
232                    }
233                ]
234            },
235            {
236                "attachments": {
237                    "itemValueAfter": "",
238                    "itemCode": "P00019914",
239                    "itemName": "目标多选",
240                    "recordCode": "1735599610895929344-90992"
241                },
242                "opType": "CREATE",
243                "id": "recordCode,inhosCode,itemCode",
244                "fields": [
245                    {
246                        "name": "itemValue",
247                        "after": ""
248                    }
249                ]
250            },
251            {
252                "attachments": {
253                    "itemValueAfter": "",
254                    "itemCode": "P00019903",
255                    "itemName": "多选项选中",
256                    "recordCode": "1735599610895929344-90992"
257                },
258                "opType": "CREATE",
259                "id": "recordCode,inhosCode,itemCode",
260                "fields": [
261                    {
262                        "name": "itemValue",
263                        "after": ""
264                    }
265                ]
266            },
267            {
```

```
268                        "attachments": {
269                            "itemValueAfter": "P00019850",
270                            "itemCode": "P00019849",
271                            "itemName": "单选项选中",
272                            "recordCode": "1735599610895929344-90992"
273                        },
274                        "opType": "CREATE",
275                        "id": "recordCode,inhosCode,itemCode",
276                        "fields": [
277                            {
278                                "name": "itemValue",
279                                "after": "P00019850"
280                            }
281                        ]
282                    }
283                ],
284                "opType": "CREATE",
285                "isError": false,
286                "opName": "新增护理评估明细",
287                "startTime": 1702634168070,
288                "id": "recordCode,inhosCode,itemCode",
289                "endTime": 1702634168109
290            }
291        ],
292    "entryLog": {
293        "attachments": {
294            "patName": "庞小萍",
295            "bedNo": "21201"
296        },
297        "module": "zsg-测试动作属性-评估单",
298        "operator": "李",
299        "content": "",
300        "isError": false,
301        "opName": "保存/更新护理评估数据",
302        "startTime": 1702634167540,
303        "logId": "13871229659971649",
304        "endTime": 1702634168480
305    },
306    "commonExitLogs": []
307 }
```

可能初次看到此结构的数据是一脸闷逼的，但是实际并没有那么复杂，多搞多看多实践就明白了~

后续会补充对明细部分的说明~

删

在主操作添加@LachesisEntryLog注解：

```java
@Override
@LachesisEntryLog(opName = "删除护理评估数据",
    operator = "{@orderUtils.getUserNameByCode(@valueBeanStamp.getUserCodeInConext())}",
    visitor = DocDataEvaluateRecordEntryLogVisitor.class,
    logId = "{T(com.yomahub.tlog.context.TLogContext).getTraceId()}")
public void deleteRecord(String inhosCode, String templateCode, String documentCode, String headerCode, String recordCode) {
    // ...
}
```

在子操作添加@LachesisOpDataExitLog注解：

```java
@LachesisDataOpExitLog(opName = "删除普通文书明细",
    id = "seqId",
    opType = OpType.DELETE,
    before = "{getOrdinaryRecordDetailByRecordCodes(#a0,#a1)}",
    visitor = DocDataOrdinaryRecordDataOpExitLogVisitor.class,
    owner = ORDINARY_RECORD_DETAIL_TABLE)
void batchDeleteDetails(@Param("inhosCode") String inhosCode,
    @Param("recodeCodes") List<String> recordCodes);
```

触发方法调用后，根据默认策略产生的操作记录日志内容如下：

```json
{
    "attachments": {
        "patName": "庞小萍",
        "bedNo": "21201"
    },
    "module": "zsg-测试动作属性-评估单",
    "operator": "李",
    "content": "删除列(多选项选中)[];删除列(目标多选)[];删除列(单选项选中)[1-10分选中];删除列(选中赋值)[];删除列(文本框赋值)[];删除列(11-20分选中)[];删除列(时间)[17:55];删除列(总分)[0];删除列(21-30分选中)[];删除列(风险等级)[];删除列(多选项算分用)[];删除列(日期)[2023-12-15]",
    "isError": false,
```

```
 10        "opName": "删除护理评估数据",
 11        "startTime": 1702635015369,
 12        "logId": "13871285230436417",
 13        "endTime": 1702635016240
 14    }
```

同上配置 *lachesislog.log-enable=true* 时，就会看到一些明细：

中间明细

展开源码

```
  1    {
  2        "dataOpExitLogs": [
  3            {
  4                "owner": "doc_data_evaluate_record_detail",
  5                "attachments": {},
  6                "records": [
  7                    {
  8                        "attachments": {
  9                            "itemCode": "P00019902",
 10                            "itemValueBefore": "",
 11                            "itemName": "文本框赋值",
 12                            "recordCode": "1735599610895929344-90992"
 13                        },
 14                        "opType": "DELETE",
 15                        "pValue": "16099160",
 16                        "id": "seqId",
 17                        "fields": [
 18                            {
 19                                "before": "",
 20                                "name": "itemValue"
 21                            }
 22                        ]
 23                    },
 24                    {
 25                        "attachments": {
 26                            "itemCode": "P00019917",
 27                            "itemValueBefore": "",
 28                            "itemName": "选中赋值",
 29                            "recordCode": "1735599610895929344-90992"
 30                        },
 31                        "opType": "DELETE",
 32                        "pValue": "16099161",
 33                        "id": "seqId",
```

```json
34              "fields": [
35                  {
36                      "before": "",
37                      "name": "itemValue"
38                  }
39              ]
40          },
41          {
42              "attachments": {
43                  "itemCode": "P00019849",
44                  "itemValueBefore": "P00019850",
45                  "itemName": "单选项选中",
46                  "recordCode": "1735599610895929344-90992"
47              },
48              "opType": "DELETE",
49              "pValue": "16099162",
50              "id": "seqId",
51              "fields": [
52                  {
53                      "before": "P00019850",
54                      "name": "itemValue"
55                  }
56              ]
57          },
58          {
59              "attachments": {
60                  "itemCode": "P00019850",
61                  "itemValueBefore": "1",
62                  "itemName": "1-10分选中",
63                  "recordCode": "1735599610895929344-90992"
64              },
65              "opType": "DELETE",
66              "pValue": "16099163",
67              "id": "seqId",
68              "fields": [
69                  {
70                      "before": "1",
71                      "name": "itemValue"
72                  }
73              ]
74          },
75          {
76              "attachments": {
77                  "itemCode": "P00019851",
78                  "itemValueBefore": "",
79                  "itemName": "11-20分选中",
80                  "recordCode": "1735599610895929344-90992"
```

```
 81                          },
 82                          "opType": "DELETE",
 83                          "pValue": "16099164",
 84                          "id": "seqId",
 85                          "fields": [
 86                              {
 87                                  "before": "",
 88                                  "name": "itemValue"
 89                              }
 90                          ]
 91                      },
 92                      {
 93                          "attachments": {
 94                              "itemCode": "P00019883",
 95                              "itemValueBefore": "2023-12-15",
 96                              "itemName": "日期",
 97                              "recordCode": "1735599610895929344-90992"
 98                          },
 99                          "opType": "DELETE",
100                          "pValue": "16099153",
101                          "id": "seqId",
102                          "fields": [
103                              {
104                                  "before": "2023-12-15",
105                                  "name": "itemValue"
106                              }
107                          ]
108                      },
109                      {
110                          "attachments": {
111                              "itemCode": "P00019853",
112                              "itemValueBefore": "",
113                              "itemName": "21-30分选中",
114                              "recordCode": "1735599610895929344-90992"
115                          },
116                          "opType": "DELETE",
117                          "pValue": "16099165",
118                          "id": "seqId",
119                          "fields": [
120                              {
121                                  "before": "",
122                                  "name": "itemValue"
123                              }
124                          ]
125                      },
126                      {
127                          "attachments": {
```

```
128                    "itemCode": "P00019884",
129                    "itemValueBefore": "17:55",
130                    "itemName": "时间",
131                    "recordCode": "1735599610895929344-90992"
132                },
133                "opType": "DELETE",
134                "pValue": "16099154",
135                "id": "seqId",
136                "fields": [
137                    {
138                        "before": "17:55",
139                        "name": "itemValue"
140                    }
141                ]
142            },
143            {
144                "attachments": {
145                    "itemCode": "P00019854",
146                    "itemValueBefore": "",
147                    "itemName": "多选项算分用",
148                    "recordCode": "1735599610895929344-90992"
149                },
150                "opType": "DELETE",
151                "pValue": "16099155",
152                "id": "seqId",
153                "fields": [
154                    {
155                        "before": "",
156                        "name": "itemValue"
157                    }
158                ]
159            },
160            {
161                "attachments": {
162                    "itemCode": "P00019903",
163                    "itemValueBefore": "",
164                    "itemName": "多选项选中",
165                    "recordCode": "1735599610895929344-90992"
166                },
167                "opType": "DELETE",
168                "pValue": "16099156",
169                "id": "seqId",
170                "fields": [
171                    {
172                        "before": "",
173                        "name": "itemValue"
174                    }
```

```json
175                    ]
176                },
177                {
178                    "attachments": {
179                        "itemCode": "P00019914",
180                        "itemValueBefore": "",
181                        "itemName": "目标多选",
182                        "recordCode": "1735599610895929344-90992"
183                    },
184                    "opType": "DELETE",
185                    "pValue": "16099157",
186                    "id": "seqId",
187                    "fields": [
188                        {
189                            "before": "",
190                            "name": "itemValue"
191                        }
192                    ]
193                },
194                {
195                    "attachments": {
196                        "itemCode": "P00019863",
197                        "itemValueBefore": "0",
198                        "itemName": "总分",
199                        "recordCode": "1735599610895929344-90992"
200                    },
201                    "opType": "DELETE",
202                    "pValue": "16099158",
203                    "id": "seqId",
204                    "fields": [
205                        {
206                            "before": "0",
207                            "name": "itemValue"
208                        }
209                    ]
210                },
211                {
212                    "attachments": {
213                        "itemCode": "P00019864",
214                        "itemValueBefore": "",
215                        "itemName": "风险等级",
216                        "recordCode": "1735599610895929344-90992"
217                    },
218                    "opType": "DELETE",
219                    "pValue": "16099159",
220                    "id": "seqId",
221                    "fields": [
```

```
222                            {
223                                "before": "",
224                                "name": "itemValue"
225                            }
226                        ]
227                    }
228                ],
229                "opType": "DELETE",
230                "isError": false,
231                "opName": "删除护理评估明细",
232                "startTime": 1702635015547,
233                "id": "seqId",
234                "endTime": 1702635015620
235            }
236        ],
237        "entryLog": {
238            "attachments": {
239                "patName": "庞小萍",
240                "bedNo": "21201"
241            },
242            "module": "zsg-测试动作属性-评估单",
243            "operator": "李",
244            "content": "",
245            "isError": false,
246            "opName": "删除护理评估数据",
247            "startTime": 1702635015369,
248            "logId": "13871285230436417",
249            "endTime": 1702635016240
250        },
251        "commonExitLogs": []
252    }
```

改

在主操作添加@LachesisEntryLog注解：

```
1   @LachesisEntryLog(module = "护理计划单",
2       opName = "更新护理计划单",
3       operator = "{@userCodeGetter.getUserCode()}",
4       logId = "{T(com.yomahub.tlog.context.TLogContext).getTraceId()}",
5       content = "{T(cn.hutool.json.JSONUtil).toJsonStr(#a0)}")
6   @PutMapping("/update")
```

```
 7   public ResultMessage<DocDataNurseRecord> update(@RequestBody
     DocDataNurseRecord record) {
 8       DocDataNurseRecord result = docDataNurseRecordService.update(record);
 9       return ResultMessage.success(result);
10   }
```

在子操作添加@LachesisOpDataExitLog注解：

```
 1   @LachesisDataOpExitLog(opName = "修改护理计划单主表信息",
 2       opType = OpType.UPDATE,
 3       id = "seqId",
 4       condition = "{(#a0 != null && #a0.seqId != null)}",
 5       before = "{selectByPrimaryKey(#a0.seqId)}",
 6       after = "{#a0}",
 7       owner = "doc_data_nurse_record")
 8   int updateByPrimaryKey(DocDataNurseRecord record);
```

触发方法调用后，根据默认策略产生的操作记录日志内容如下：

```
 1   {
 2       "attachments": {
 3           "patName": "哈哈哈"
 4       },
 5       "module": "护理计划单",
 6       "operator": "uid",
 7       "content": "
     {\"documentCode\":\"D00757657\",\"createPerson\":\"123\",\"templateCode\":\"T1
     1111632\",\"headerCode\":\"H00707268\",\"inhosCode\":\"22410558\",\"patCode\":
     \"1186512\",\"templateName\":\"护理记11单
     12\",\"createTime\":1701439683000,\"recordDate\":1698993300000,\"wardCode\":\"
     311\",\"recordCode\":\"1720329459751347200\",\"seqId\":114,\"primaryKey\":114}
     ",
 8       "isError": false,
 9       "opName": "更新护理计划单",
10       "startTime": 1702619898020,
11       "logId": "13870294500507713",
12       "endTime": 1702619898070
13   }
```

同上配置 *lachesislog.log-enable=true* 时，就会看到一些明细：

中间明细

展开源码

```
1   {
2       "dataOpExitLogs": [
3           {
4               "owner": "doc_data_nurse_record",
5               "attachments": {},
6               "records": [
7                   {
8                       "attachments": {},
9                       "opType": "UPDATE",
10                      "pValue": "114",
11                      "id": "seqId",
12                      "fields": [
13                          {
14                              "before": "T11111633",
15                              "name": "templateCode",
16                              "after": "T11111632"
17                          }
18                      ]
19                  }
20              ],
21              "opType": "UPDATE",
22              "isError": false,
23              "opName": "修改护理计划单主表信息",
24              "startTime": 1702619898021,
25              "id": "seqId",
26              "endTime": 1702619898068
27          }
28      ],
29      "entryLog": {
30          "attachments": {
31              "patName": "哈哈哈"
32          },
33          "module": "护理计划单",
34          "operator": "uid",
35          "content": "
    {\"documentCode\":\"D00757657\",\"createPerson\":\"123\",\"templateCode\":\"T1
    1111632\",\"headerCode\":\"H00707268\",\"inhosCode\":\"22410558\",\"patCode\":
    \"1186512\",\"templateName\":\"护理记11单
    12\",\"createTime\":1701439683000,\"recordDate\":1698993300000,\"wardCode\":\"
    311\",\"recordCode\":\"1720329459751347200\",\"seqId\":114,\"primaryKey\":114}
    ",
36          "isError": false,
37          "opName": "更新护理计划单",
```

```
38          "startTime": 1702619898020,
39          "logId": "13870294500507713",
40          "endTime": 1702619898070
41      },
42      "commonExitLogs": []
43  }
```

查

暂时不考虑此场景，理论上是支持的，后续有场景使用时，再做补充~

操作记录查询接口

设计理念

通过上述示例，可以总结下当初设计的理念：

- 要采集操作记录，必须在操作入口添加@LachesisEntryLog注解
- 简单操作记录场景：可以仅使用@LachesisEntryLog注解
- 复杂操作记录场景：推荐使用各个注解组合，@LachesisEntryLog注解作为既是作为入口，同时也是各个子操作记录的归宿（即因为目前存储层面只有entry_log一张表）。

配置

配置说明

1.开启配置

- 首先，判断是否设置 *lachesislog.enable=true* ， 默认为true ；
- 其次，业务端项目是否扩展实现了该方法（方便业务端动态开启与关闭）：com.lachesis.lachesislog.starter.config.ILachesisLogCustomConfig#enable ，结果为true的情况：

a. 没有实现的情况下，**默认为true**；

b. 业务端扩展ILachesisLogCustomConfig接口实现，通过enable方法获取结果为true。

- 最后，判断@LachesisEntryLog，@LachesisOpDataExitLog，@LachesisCommonExitLog注解中condition属性配置，结果为true的情况：

a. condition可以直接配置字符串"true"时，**默认为"true"**；

b. 也可以配置的SPEL表达式，通过SPEL表达式计算得到结果"true"时。

当经过以上 **三个步骤所有结果均为true时（默认三者均为true）** ，将会进行相关操作记录采集，但凡其中有一个步骤返回结果为false将不会进行采集。

对于上述第二点，可以参考mnis项目，配合配置中心可以实现对日志采集的动态开启或关闭：
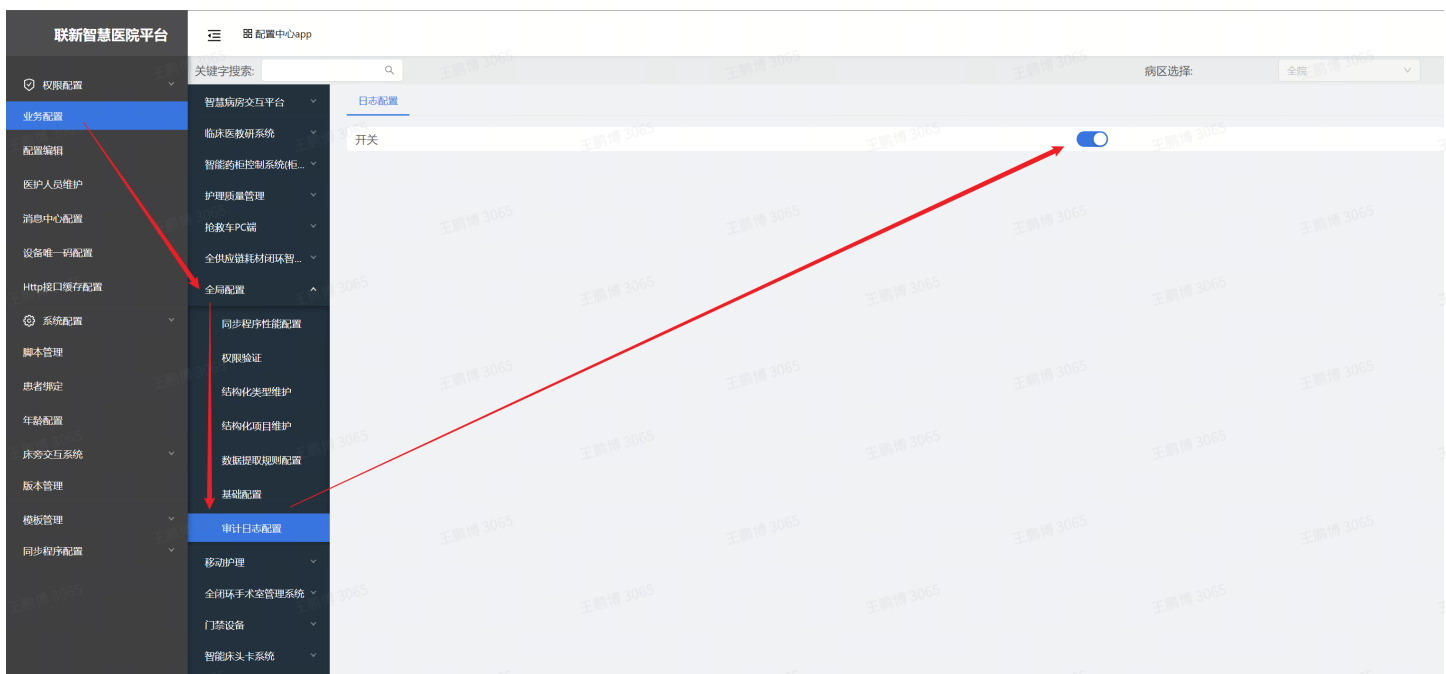
2.详细日志打印配置

一般在业务端扩展实现日志重组（即使用lachesislog框架采集的通用日志根据业务实际使用场景定制展示内容）时需要了解日志的详细信息，方便进行了扩展。当开启时，在业务日志中打印日志详情。

配置项：*lachesislog.log-enable=true*

3.日志处理配置

默认的处理策略只是打印操作记录。

配置项：*lachesislog.listener-name=default*

当前也支持将日志发送至服务端进行存储，具体的配置如下：

```
1    lachesislog:
2      listener-name: rabbitmq
3      listener:
4        rabbitmq:
5          host: 10.2.3.172
6          port: 5672
7          username: root
8          password: root
9          virtual-host: /
10         message-printable: true
11         app: ${spring.application.name}
```

4.监控配置

在日志采集过程中框架本身会有一定的性能损耗，可以通过开启相应的配置查看具体情况。

配置项：*lachesislog.monitor-enable=true*

配置示例一

线上推荐配置

```
1    lachesislog:
2      enable: true
3      log-enable: false
4      monitor-enable: false
5      # 默认只是操作记录打印并不存储，需要存储时改为rabbitmq
6      listener-name: default
7      listener:
8        rabbitmq:
9          # 需要操作记录存储时指定MQ服务IP
10         host: IP
```

```
11          port: 5672
12            username: root
13            password: root
14            virtual-host: /
15            message-printable: true
16            app: ${spring.application.name}
17        # 指定部署LachesisLog服务所在的机器IP
18        server-ip: IP
```

存储

MySQL存储

目前所采用的方案是存储在MySQL，那么为了应对数据量较大的操作记录，对其进行了按月分表。

TODO

☑ ~~TLog整合~~

　　☑ ~~服务端整合TLog~~

　　☑ ~~业务端将TLogTraceId与操作记录关联，便于后续操作问题追踪~~

☐ Dubbo整合

　　◦ 查询操作记录接口，业务场景的日志展示组装会存在自定义的情况，对此，操作记录组件只提供通用的数据能力，需提供Dubbo接口给业务方使用

☐ 操作记录增删改场景，进行数据量限制，谨防OOM

　　◦ 在数据操作场景，比如删除场景需要查询删除前的旧数据，如果是单条数据，性能应该还算不大，但是如果是批量行为，需要加以限制，不要因为操作记录组件问题产生业务严重的性能问题

☐ 跨线程

　　◦ 业务场景存在异步操作情形时，整体的操作就会存在跨线程行为

☐ 嵌套注解

　　◦ 背景：对于某些业务场景，可能存在操作记录注解嵌套情形

- ☐ 性能监控能力完善
  - ☑ ~~简单版本监控能力支持（目前支持可监控的指标和展示效果还比较简单，后续根据实际情况再做优化）~~
- ☐ 存储能力扩展
  - ○ 目前是基于MySQL的分表来存储操作记录，其实虽然操作记录的数据结构相对是确定的，但是为了便于不同业务扩展，类似专门用作业务扩展的attachments字段，就是一个JSON数据类型，基于MySQL的关系型数据库存储时，也没有使用最新的JSON类型（虽然MySQ 5.7之后L已经支持了，但是可能会存在医院还使用的是MySQL5.7之前的版本），而是基于JSON字符串进行存储，可能再查询扩展字段中的内容时，查询 性能可能会比较差。同时呢，可能基于MySQL的存储，磁盘占用也应该不小

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