# 《lkp test安装使用以及与Jenkins，gitlab集成部署指导手册》



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## 一、lkp test 添加测试用例介绍

### 样例

如下目录中的文件，完整的添加了一个典型的测试用例memtier:

```
programs/memtier/jobs/memtier-dcpmm.yaml     # 在job YAML里指定想跑的programs/params
programs/memtier/jobs/memtier.yaml       # 可以预定义很多的jobs
programs/memtier/meta.yaml           # memtier描述文件
programs/memtier/PKGBUILD            # memtier下载编译
programs/memtier/run                 # memtier运行脚本
programs/memtier/parse               # memtier结果解析
```

如果加的program type属于monitor/setup脚本，则需要放到对应的monitors/, setup/目录下，而非programs/目录。 集中存放monitor/setup脚本，有利于他人查找和复用。

其中jobs/下的YAML文件，定义了memtier的各种常见运行参数、及与其它脚本的组合。 用户要跑其中的一个测试组合，典型步骤如下

```
# 把job YAML从矩阵描述形式分解为一系列原子任务
$ lkp split memtier-dcpmm.yaml
jobs/memtier-dcpmm.yaml => ./memtier-dcpmm-1-cs-localhost-0-8-1-1-65535-never-never.yaml
jobs/memtier-dcpmm.yaml => ./memtier-dcpmm-1-cs-localhost-0-24-1-1-65535-never-never.yaml
# 安装依赖，包括安装meta.yaml里depends字段描述的软件包，以及调用PKGBUILD
$ lkp install ./memtier-dcpmm-1-cs-localhost-0-8-1-1-65535-never-never.yaml
# 运行任务，会调用其中指定的各run脚本，结果保存到/lkp/result/下一个新建的目录里
# 结束后自动运行各parse脚本，提取各结果指标并汇集到stats.json
$ lkp run ./memtier-dcpmm-1-cs-localhost-0-8-1-1-65535-never-never.yaml
```

### 概述

一个测试用例一般涉及如下部分

```
1) 基本信息说明            # meta.yaml metadata部分
2) 安装哪些依赖            # meta.yaml depends字段
3) 下载编译一些程序      # PKGBUILD脚本
4) 对所在环境做哪些设置        # run脚本 (type=setup)
5) 监控系统的一些状态         # run脚本 (type=monitor)
6) 运行哪些程序，以什么参数运行    # run脚本 (type=workload)
7) 怎么解析结果，抽取度量指标     # parse脚本
```

为了实现最大的灵活性、可复用性，我们以job-program-param三层模型来组织测试用例。 一个job YAML的典型内容为

```
monitor_program1:
monitor_program2:
...
setup_program1:
```

```
    param1:
    param2:
setup_program2:
    param1:
...
workload_program1:
    param1:
workload_program2:
    param1:
    param2:
```

其中每个脚本只做一件事，这样组合起来会很灵活和强大。monitor/setup programs的可复用性就很好。

用户跑一个用例的入口是job，可以自己书写job，也可以使用jobs/目录下预定义的job。 当运行一个job时，lkp会找到job中指定的各类programs，以指定的params key/val为环境变量，执行各program。 确切的规则如下

```
# job YAML 内容
    $program:
       param1: val1
       param2: val2
# lkp install job 执行的伪代码
    find programs/$program/meta.yaml or
         programs/**/meta-$program.yaml
    for each package in meta YAML's depends field:
        check install package RPM/DEB
        if OS has no such package:
            find programs/$package/PKGBUILD or
                 programs/**/PKGBUILD-$package
            makepkg for the first found one
# lkp run job 执行的 shell 伪代码
    # run
    export param1=val1
    export param2=val2
    find programs/$program/run or
         programs/**/run-$program
    run the first found one, redirecting stdout/stderr to $RESULT_ROOT/$program
    # parse
    run its parse script < $RESULT_ROOT/$program | dump-stat to $RESULT_ROOT/$program.json
    unite all $RESULT_ROOT/$program.json to $RESULT_ROOT/stats.json
```

### 添加meta.yaml描述文件

一个meta.yaml文件描述一个program，其结构如下

```
metadata:
    name:       # 程序名
    summary:    # 单行描述
    description:    # 多行/多段详细描述
    homepage:   # 脚本所调用程序的上游项目的主页URL
type:           # monitor|setup|daemon|workload
monitorType:        # one-shot|no-stdout|plain
depends:
    gem:            # ruby gem 依赖
    pip:            # python pip 依赖
    ubuntu@22.04:       # ubuntu 22.04的DEB包依赖
    openeuler@22.03:    # openeuler 22.03的RPM包依赖
pkgmap: # 各OS之间的包名映射，这样我们可以在depends里指定一个OS的完整依赖列表，通过少量包名映射来支持其它OS
        archlinux..debian@10:
    debian@10..openeuler@22.03: # 以下为两个样例
        dnsutils: bind-utils
        cron: cronie
params: # run脚本可以接受的环境变量参数，以下为样例
    runtime:
        type: timedelta
        doc: length of time, with optional human readable time unit suffix
        example: 1d/1h/10m/600s
    ioengine:
        type: str
        values: sync libaio posixaio mmap rdma
results: # parse脚本可以从结果中提取的metrics，以下为样例
    write_bw_MBps:
        doc: average write bandwidth
        kpi: 1 # weight for computing performance index; negative means the larger the worse
```

### 添加job YAML

一般我们需要主要跑一个type=workload的program，同时再跑一些type=monitor/setup/daemon的programs，加上它们的参数，构成一个完整的测试用例。 我们用一个个的job YAML来描述这些测试用例。

所以预定义job YAML大体上可以按workload来组织，放在路径下

```
programs/$workload/jobs/xxx.yaml
```

当然也可以按更大粒度来组织，比如场景、测试类型等分类，此时可以放在路径下

```
jobs/$test_scene/xxx.yaml
jobs/$test_class/xxx.yaml
```

以上预定义jobs的搜索路径，lkp框架代码都支持。具体path glob pattern是

```
programs/*/jobs/*.yaml
jobs/**/*.yaml
```

### 添加程序

Job YAML中引用的programs，需要您预先写好，lkp会在如下路径搜索其文信息/脚本：

```
1st search path             2nd search path
programs/$program/meta.yaml     programs/**/meta-$program.yaml
programs/$program/{run,parse}       programs/**/{run,parse}-$program
programs/$package/PKGBUILD      programs/**/PKGBUILD-$package
```

程序一般添加到 programs/$program/ 目录下，具体添加以下几个脚本

```
programs/$program/meta.yaml # 描述文件
programs/$program/run       # 接收/转换环境变量传过来的参数，运行目标程序
programs/$program/parse     # 解析结果(一般是run的stdout)，输出metrics (YAML key/val)
programs/$program/PKGBUILD  # 下载编译安装run调用的目标程序
tests/$program => ../programs/$program/run  # 创建符号链接 保持兼容
```

其中PKGBUILD仅必要时添加。parse一般在program type=monitor/workload时才需要。

一般一个program一个目录。但有时候client/server类型的测试，把workload+daemon programs放在一起比较方便。 此时可以参照sockperf，把sockperf-server daemon以如下方式添加到sockperf workload目录下：

```
programs/sockperf/meta-sockperf-server.yaml
programs/sockperf/run-sockperf-server
```

### 添加依赖

一个program的依赖表述为

```
    programs/$program/meta.yaml
            depends:
                    debian@10:
        - $package1
        - $package2
    pkgmap:
        debian@10..centos@8: # centos 8不自带$package2，映射为空
            $package2:
    programs/$program/PKGBUILD-$package1
    programs/$program/PKGBUILD-$package2
```

这里定义了两类依赖 1) OS自带的包 2) 需要从源码下载编译的包 当OS包含package1/package2时，lkp框架可自动安装对应的rpm/deb; 如果没有，再使用PKGBUILD-xxx构建出包。

例如，在debian 10中，lkp install会执行

```
apt-get install $package1 $package2
```

在在centos 8中，lkp install会执行

```
yum install $package1
makepkg PKGBUILD-$package2 # 从源码下载编译
```

如您希望强制从源码编译下载，无论所在OS是否包含RPM/DEB包，那么可以通过指定PKGBUILD依赖

```
depends:
    PKGBUILD:
    - $package1
```

那么lkp install会无条件编译$package1

注意，PKGBUILD语义上对应一个package，而不是对应
program。 这两者语义上不同，虽然很多时候两者内容是一样的。当内容一样时，比如

```
programs/$program/PKGBUILD-$package
```

也可以写为简化形式

```
programs/$program/PKGBUILD # when $package=$program
```

注意，PKGBUILD文件名及其内部depends/makedepends字段里的$package使用的是archlinux包名。 所以其它OS缺失此包，或者有此包，但是名字不一样的话，需要配置对应的pkgmap包名映射，或者加上OS后缀，比如

```
makedepends_debian_11=(lam4-dev libopenmpi-dev libmpich-dev pvm-dev)
```

### 示例-云测工具（compatibility-test）

1. 在programs 文件夹下创建compatibility-test文件夹，里面至少要包含以下几个文件，其余文件可以根据需求自行决定是否添加
   programs/compatibility-test/jobs/compatibility-test.yaml # 预定义compatibility-test的job，需要与文件夹名字一致
   programs/compatibility-test/meta.yaml # compatibility-test描述文件
   programs/compatibility-test/run # compatibility-test运行脚本

2. 文件内容详情

programs/compatibility-test/jobs/compatibility-test.yaml:

```
suite: compatibility-test # 项目介绍
category: functional  # 项目类型（functional是只跑run脚本不会同时拉monitor监控应用，如果想同时使用monitor请写benchmark）
file_path: /home/lj/test/compatibility_testing/Chinese # run 脚本的输入参数，如果有多个请写在下面compatibility-test:后
compatibility-test: # run 脚本的输入参数，
# 如果同一参数有多个不同值需要运行，可以按照以下方式参考
xxx:
    parameter1:
        - value1
        - value2

    parameter2:
        - value1
        - value2
```

programs/compatibility-test/meta.yaml:

```
metadata:
  name: compatibility-test  # 名字
  summary: A program can run some basic tests # 这个项目的总结
  description: run compatinility test and generate the report # 这个项目的介绍
  homepage: https://gitee.com/openeuler/devkit-pipeline # 项目的网址
type: workload # 项目类型
depens: # 项目依赖
params: # 需要的参数
results: # 需要对结果进行处理
```

programs/compatibility-test/run:

```
# 这个文件是shell脚本，当使用lkp test命令去运行指定yaml的时候会把yaml的参数传入到run 文件中，请根据各自项目自行写此文件
#!/bin/bash
set -e
ct_sh_path=${HOME}/.local/compatibility_testing/Chinese/compatibility_testing.sh
cloud_jar=${HOME}/.local/compatibility_testing/cloudTest.jar
cd ${HOME}/.local/compatibility_testing/Chinese/
#sh $ct_sh_path
#java -jar $cloud_jar &
#sleep 15
#jar_pid=$!
#curl --location --request GET 'http://127.0.0.1:10037/api/v1/report?savePath=/'${HOME}'/.local/compatibility_testing/Chinese/log.json&file=/'${HOME}'/.local/compatibility_testing/Chinese/l
#kill -9 $jar_pid
cp -rf ${HOME}/.local/compatibility_testing/template.html.bak /${HOME}/.local/compatibility_testing/template.html
cd ${HOME}/.local/compatibility_testing/
python3 ${HOME}/.local/compatibility_testing/json2html.py
```

3. 必要步骤

   在完成此文件夹的创建后，依然还需要两步操作去让lkp命令找到指定的运行文件

```
# 第一步 运行lkp slpit 命令去分隔jobs里面写的yaml文件，他会根据run文件以来的每个参数不同的输入值分成多个可执行的yaml文件，
例如
lkp split programs/compatibility-test/jobs/compatibility-test.yaml
# 云测工具会得到输出 programs/compatibility-test/jobs/compatibility-test.yaml => ./compatibility-test-defaults.yaml，当我们每次更新jobs下面的yaml文件的输入参数后都需要重新运行 lkp split命令
# 当我们lkp run的时候就要运行这个分隔后的yaml文件(在云测工具就是compatibility-test-defaults.yaml)
# 第二步 需要增加一个软连接
ln -s xxx/lkp-tests/programs/compatibility-test/run xxx/lkp-tests/tests/compatibility-test
```

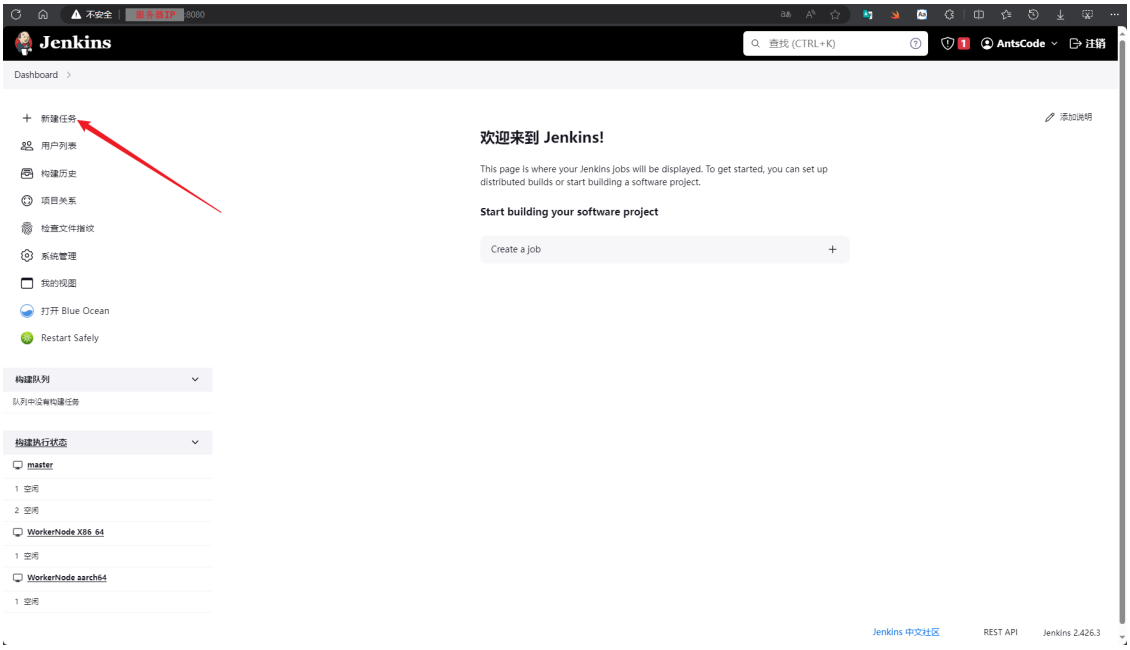
## 二、Jenkins Pipeline 中集成lkp test (以云测工具(compatibility-test)为示例)

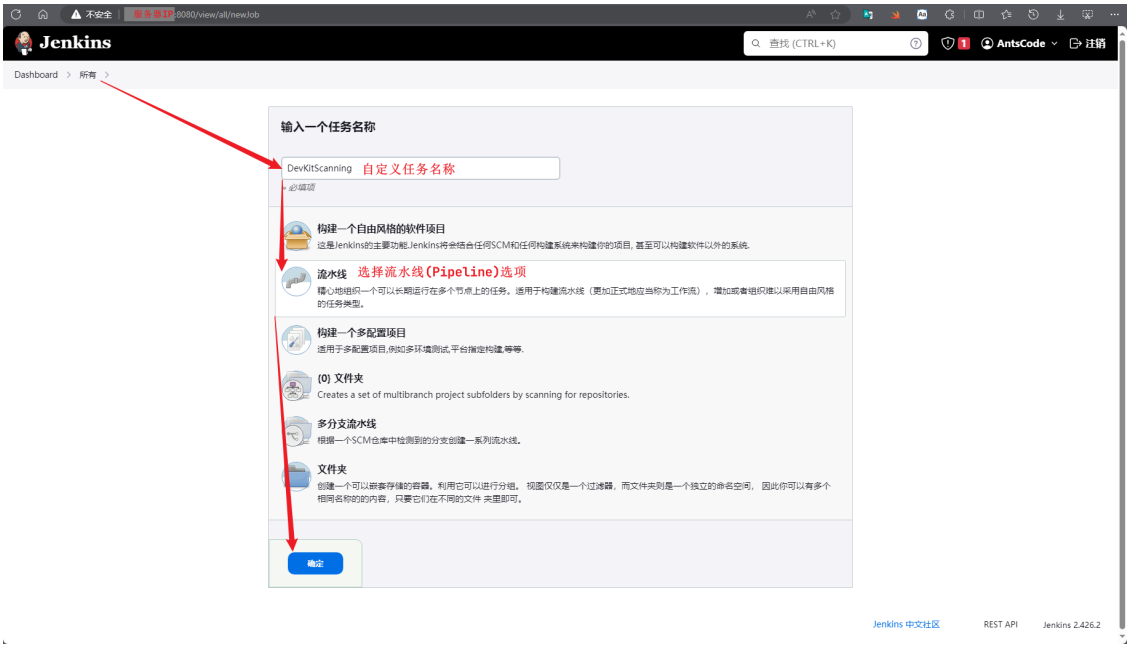
### 1 groovy 代码

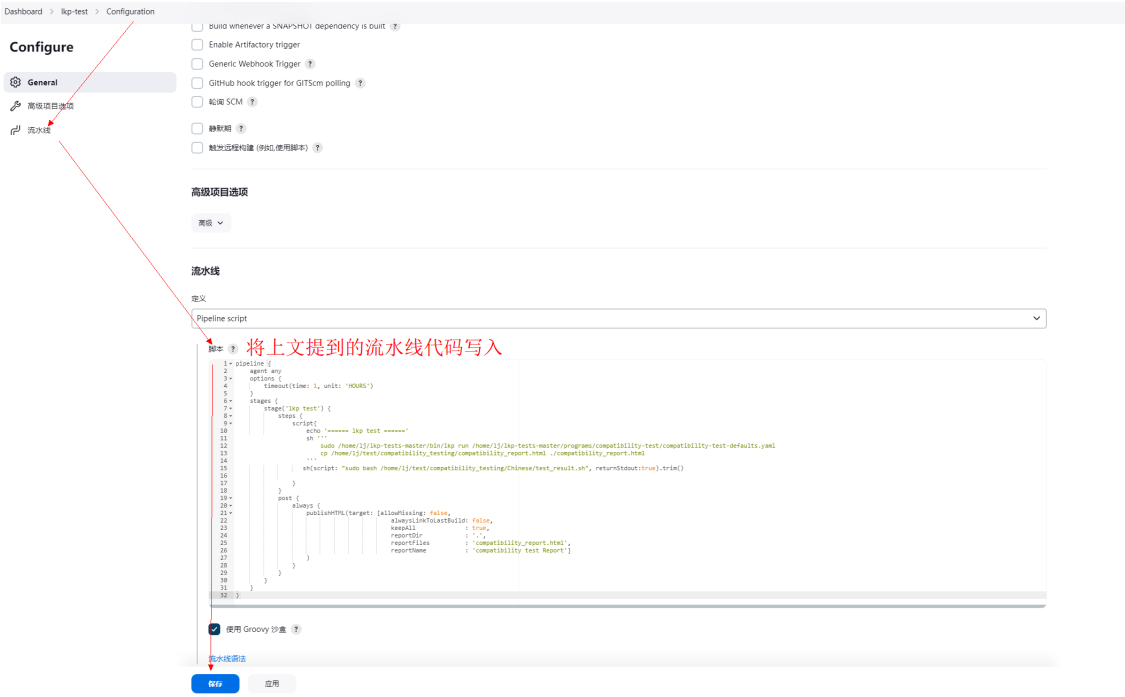
```
stage('lkp test') {
                            steps {
                                script{
                                    echo '====== lkp test ======'
                                    sh '''
                                    cp -rf /home/lj/test/compatibility_testing/template.html.bak /home/lj/test/compatibility_testing/template.html # 用于最终生成报告
                                        sudo /home/lj/lkp-tests-master/bin/lkp run /home/lj/lkp-tests-master/programs/compatibility-test/compatibility-test-defaults.yaml
                                        cp -rf /home/lj/test/compatibility_testing/compatibility_report.html ./compatibility_report.html
                                    '''
                                   sh(script: "sudo bash /home/lj/test/compatibility_testing/Chinese/test_result.sh", returnStdout:true).trim() # 用来根据报告结果设置流水线结果

                                }
                            }
                            post {
                                always {
                                    publishHTML(target: [allowMissing: false,
                                                         alwaysLinkToLastBuild: false,
                                                         keepAll              : true,
                                                         reportDir            : '.',
                                                         reportFiles          : 'compatibility_report.html',
```

```
                                                                    reportName            : 'compatibility test
Report']
                                                                    )
                                                                }
                                                            }
```

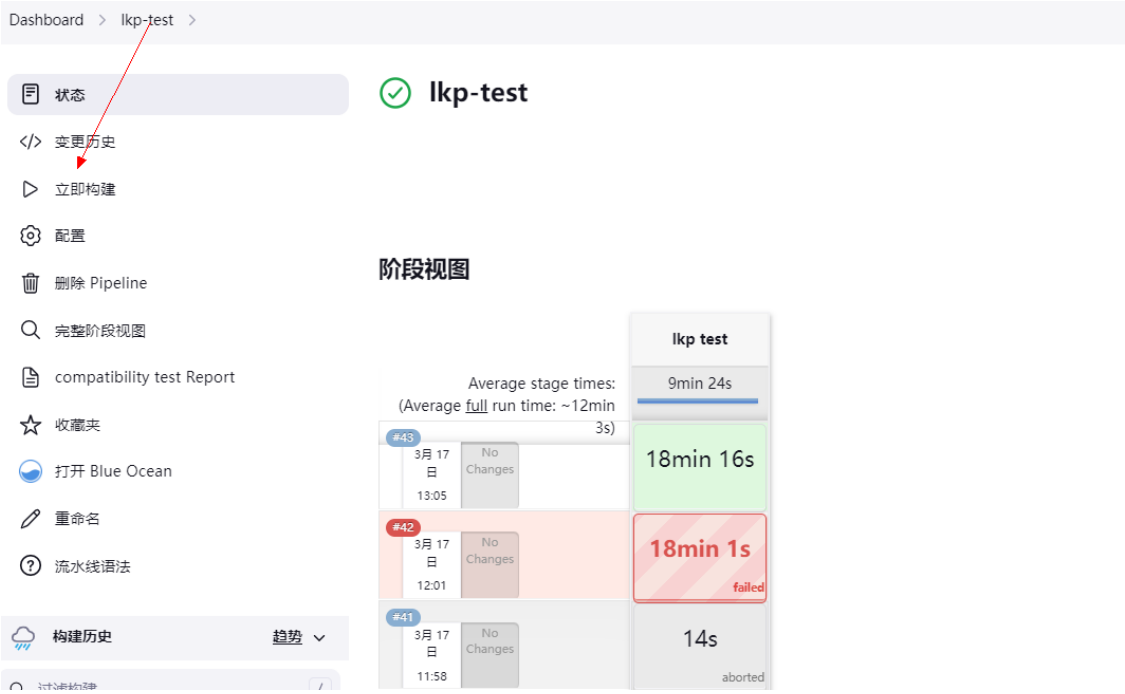
## 2 创建流水线






### 3. 执行任务

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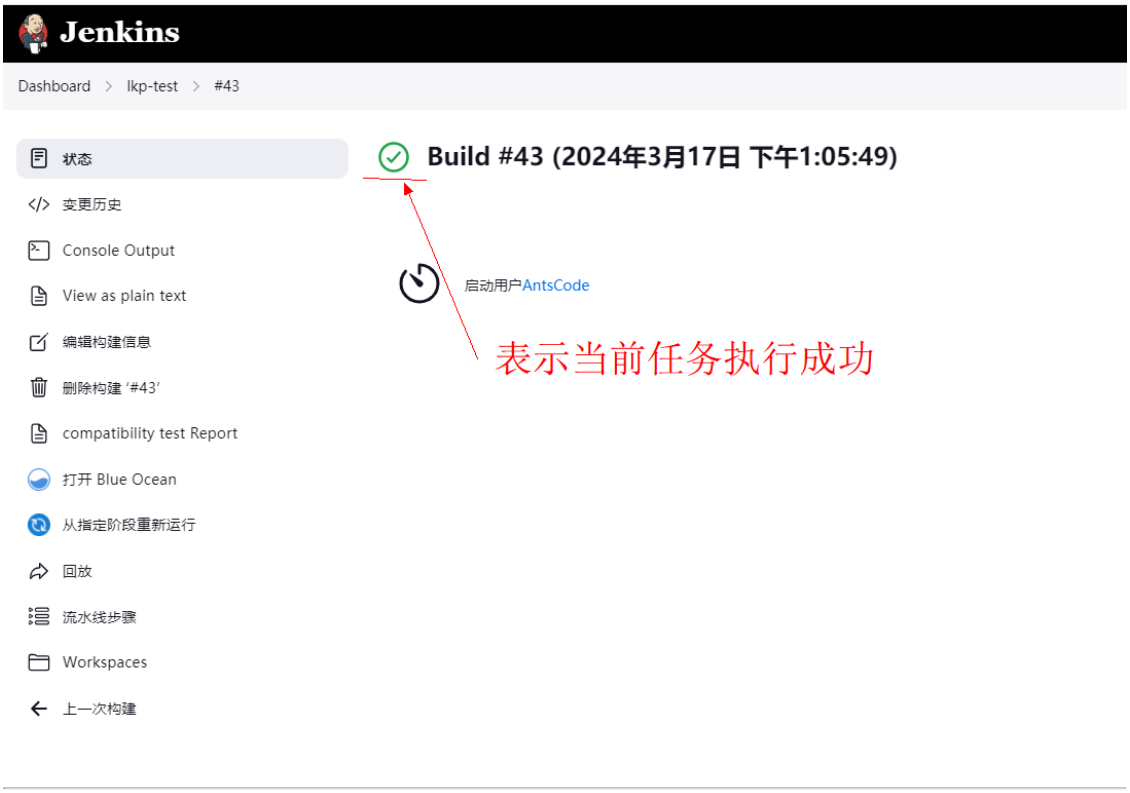
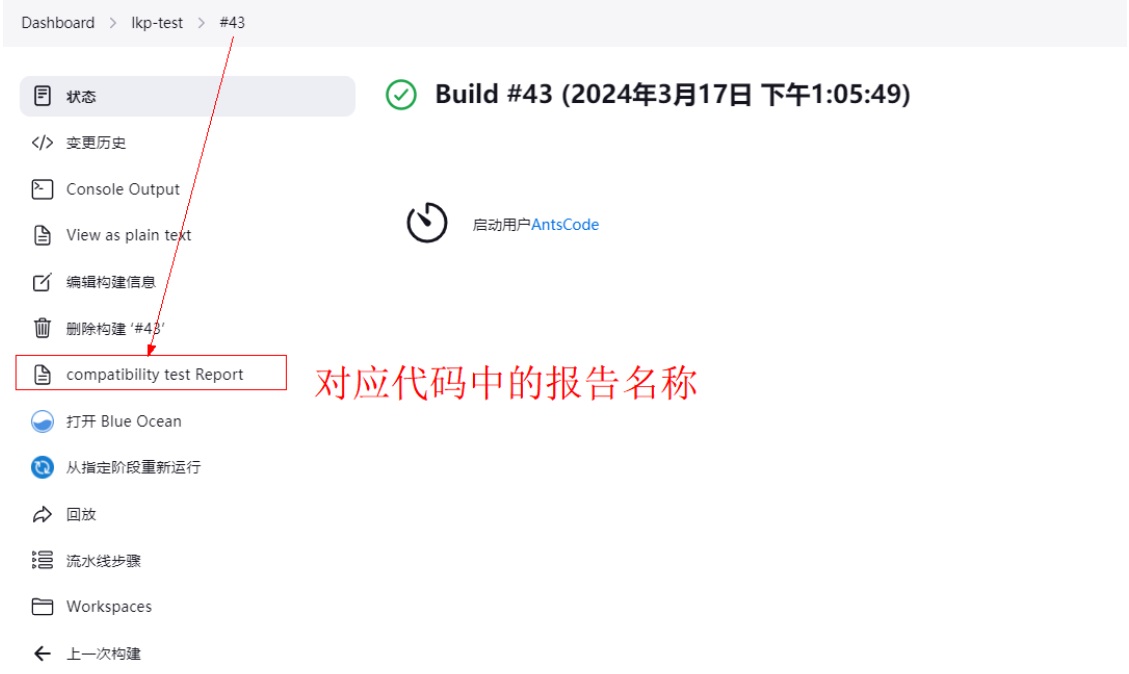
### 4. 查看任务执行状态




**5. 查看报告**




**6. lkp test报告内容(以云测工具(compatibility-test)为示例)**

**鲲鹏测试报告**

Search:

| id | result | reason | evidence |
|---|---|---|---|
| Compatibility_Application_Start | passed | | #2024-03-23 23:08:45#info#5#业务应用test1启动完成 |
| Compatibility_Application_Stop | passed | | #2024-03-23 23:03:24#info#4#进程test1不存在 |
| Compatibility_Hardware_Server | passed | 硬件包含鲲鹏芯片，符合要求 | |
| Compatibility_Idle_Cpu | passed | | Average: all 0.51 0.00 0.36 0.00 0.00 99.13,Average: all 0.52 0.00 0.38 0.00 0.00 99.09,被测试软件启动前采集CPU资源利用率与被测试软件停止后CPU利用率之间的波动为0.04 %,小于 1.00 % . |
| Compatibility_Idle_Disk | passed | | Average: 3.88 0.00 15.53 0.00 4.00 0.00 0.43 0.17 openeuler-root,Average: 3.65 0.00 14.60 0.00 4.00 0.00 0.04 0.23 openeuler-root,被测试软件启动前采集硬盘资源利用率与被测试软件停止后硬盘利用率之间的波动为0.06 %,小于 1.00 % . |
| Compatibility_Idle_Memory | passed | | Average: 2331064 5771318 707997 10.38 757112 2535802 1544980 10.24 2225948 1701718 98,Average: 2330568 5771117 708112 10.38 757116 2536093 1545496 10.24 2225948 1702168 135,被测试软件启动前采集内存资源利用率与被测试软件停止后内存利用率之间的波动为0.00 %,小于 1.00 % . |
| Compatibility_Idle_Network | passed | | Average: enp1s0 6.10 3.00 0.54 0.30 0.00 0.00 0.00 0.00,Average: enp1s0 5.65 3.05 0.43 0.30 0.00 0.00 0.00 0.00,被测试软件启动前采集的网卡资源接收数据与被测软件停止后采集网卡资源接收数据之间的波动为0.00 %,接收测试前波动的1.00%.,Average: docker0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00,Average: docker0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00,被测试软件启动前采集的网卡资源发送数据与被测软件停止后采集网卡资源发送数据之间的波动为0.00 %,发送测试前波动的1.00%. |
| Compatibility_Software_Name | passed | | |
| Reliability_Exception_Kill | | | |
| Reliability_Pressure_Disk | passed | | 11:12:31 PM 5.80 0.00 23.20 0.00 4.00 0.00 0.00 0.24 openeuler-root,11:12:56 PM 2.80 0.00 11.20 0.00 4.00 0.00 0.00 0.08 openeuler-root,压力测试期间硬盘 资源波动值为0.16 %,小于 5.00%. |

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# 二、FAQ

## 1. 联网安装指导

### 权限

lkp test 运行需要root用户运行，所以在自动化的过程中有一个切root的操作

### 安装教程

https://docs.openeuler.org/zh/docs/22.09/docs/certification/%E6%B5%8B%E8%AF%95%E6%A0%87%E5%87%86%E5%92%8C%E6%B5%8B%E8%AF%95%E5%B7%A5%

### 证书问题

```
https://rubygems.org/ removed from sources
[root@server2 lkp-tests]# gem sources -a https://gems.ruby-china.com/

Error fetching https://gems.ruby-china.com/:
        SSL_connect returned=1 errno=0 state=error: wrong version number (https://gems.ruby-china.com/specs.4.8.gz)
```

[解决方式]：https://developer.baidu.com/article/details/2821747

### make install 遇到的问题

1. 未从更新后的镜像源拉取资源

```
bash sbin/install-dependencies.sh
Installing packages ruby rubygems make gcc diffutils util-linux lftp hostname sudo
gzip git rubygem-json rubygem-bundler gcc-c++ ruby-devel rubygem-rake rpm-build
Installing ruby gems...
source https://rubygems.org/ not present in cache
```

[解决方式]：

```
1  #!/bin/sh
2
3  . $LKP_SRC/lib/detect-system.sh
4
5  setup_gem_china()
6  {
7          # https://mirrors.ustc.edu.cn/help/rubygems.html
8          gem sources -a http://mirrors.aliyun.com/rubygems/
9          # Note: centos7 does not work with tuna/ruby-china
10         gem sources -a https://mirrors.tuna.tsinghua.edu.cn/rubygems/
11         gem sources -a https://mirrors.ustc.edu.cn/rubygems/     #添加科大源
12         gem sources -a https://gems.ruby-china.com/
13         # Note: ustc looks not reliable
14         #  bundle config mirror.https://rubygems.org https://gems.ruby-china.com
15 }
```

将 lib/install.sh里第8行替换为可用的镜像源，以及可以屏蔽掉10-12行中不可用的镜像源

2. 卡死报错

```
[root@master01 lkp-tests]# make install
bash sbin/install-dependencies.sh
Installing packages ruby rubygems make gcc diffutils util-linux lftp hostname sudo gzip git rubygem-json rubygem-bundler gcc-c++ ruby-devel rubygem-rake rpm-build
Installing ruby gems...
source http://mirrors.aliyun.com/rubygems/ already present in the cache
```

```
Error fetching https://mirrors.tuna.tsinghua.edu.cn/rubygems/:
        too many connection resets (https://mirrors.tuna.tsinghua.edu.cn/rubygems/specs.4.8.gz)
https://mirrors.ustc.edu.cn/rubygems/ added to sources
Error fetching https://gems.ruby-china.com/:
        SSL_connect returned=1 errno=0 state=error: wrong version number (https://gems.ruby-china.com/specs.4.8.gz)
Traceback (most recent call last):
        2: from /usr/bin/bundle:23:in `<main>'
        1: from /usr/share/rubygems/rubygems.rb:308:in `activate_bin_path'
/usr/share/rubygems/rubygems.rb:289:in `find_spec_for_exe': can't find gem bundler (>= 0.a) with executable bundle (Gem::GemNotFoundException)
```

[解决方式]：
安装bundler
首先运行

```
cat Gemfile.lock | grep -A 1 "BUNDLED WITH"
```

```
[root@master01 lkp-tests]# cat Gemfile.lock | grep -A 1 "BUNDLED WITH"
BUNDLED WITH
   2.2.33
[root@master01 lkp-tests]# yum install bunder -v '2.2.33'
Loaded plugins: builddep, changelog, config-manager, copr, debug, debuginfo-install, download, generate_completion_cache, needs-restarting, playground, repoclosure, repodiff, repograph, repo
manage, reposync
YUM version: 4.2.23
```

安装相同版本

```
gem install bundler -v 2.2.33
```

3. 为更新gem缓存导致更新的镜像源未生效

```
[root@master01 lkp-tests]# make install
bash sbin/install-dependencies.sh
Installing packages ruby rubygems make gcc diffutils util-linux lftp hostname sudo gzip git rubygem-json rubygem-bundler gcc-c++ ruby-devel rubygem-rake rpm-build
Installing ruby gems...
source http://mirrors.aliyun.com/rubygems/ already present in the cache
Don't run Bundler as root. Bundler can ask for sudo if it is needed, and installing your bundle as root will break this application for all non-root users on this machine.
/usr/share/gems/gems/psych-3.0.2/lib/psych.rb:232: warning: already initialized constant Psych::LIBYAML_VERSION
/usr/share/ruby/psych.rb:232: warning: previous definition of LIBYAML_VERSION was here
/usr/share/gems/gems/psych-3.0.2/lib/psych.rb:234: warning: already initialized constant Psych::FALLBACK
/usr/share/ruby/psych.rb:234: warning: previous definition of FALLBACK was here
Fetching source index from https://rubygems.org/

Retrying fetcher due to error (2/4): Bundler::HTTPError Could not fetch specs from https://rubygems.org/ due to underlying error <SSL_connect returned=1 errno=0 state=error: wrong version nu
mber (https://rubygems.org/specs.4.8.gz)>

Retrying fetcher due to error (3/4): Bundler::HTTPError Could not fetch specs from https://rubygems.org/ due to underlying error <SSL_connect returned=1 errno=0 state=error: wrong version nu
mber (https://rubygems.org/specs.4.8.gz)>

Retrying fetcher due to error (4/4): Bundler::HTTPError Could not fetch specs from https://rubygems.org/ due to underlying error <SSL_connect returned=1 errno=0 state=error: wrong version nu
mber (https://rubygems.org/specs.4.8.gz)>

Could not fetch specs from https://rubygems.org/ due to underlying error <SSL_connect returned=1 errno=0 state=error: wrong version number (https://rubygems.org/specs.4.8.gz)>
make: *** [Makefile:7: install] Error 17
```

[解决方式]:

```
# 运行命令，删除无效镜像源
gem source
# 在更新镜像源后需要更新gem缓存，让更新的镜像源生效
gem source -u
```

4. bundle镜像源配置问题

```
[root@master01 lkp-tests]# make install
bash sbin/install-dependencies.sh
Installing packages ruby rubygems make gcc diffutils util-linux lftp hostname sudo gzip git rubygem-json rubygem-bundler gcc-c++ ruby-devel rubygem-rake rpm-build
Installing ruby gems...
source http://mirrors.aliyun.com/rubygems/ already present in the cache
Don't run Bundler as root. Bundler can ask for sudo if it is needed, and installing your bundle as root will break this application for all non-root users on this machine.
/usr/share/gems/gems/psych-3.0.2/lib/psych.rb:232: warning: already initialized constant Psych::LIBYAML_VERSION
/usr/share/ruby/psych.rb:232: warning: previous definition of LIBYAML_VERSION was here
/usr/share/gems/gems/psych-3.0.2/lib/psych.rb:234: warning: already initialized constant Psych::FALLBACK
/usr/share/ruby/psych.rb:234: warning: previous definition of FALLBACK was here
Fetching source index from https://rubygems.org/

Retrying fetcher due to error (2/4): Bundler::HTTPError Could not fetch specs from https://rubygems.org/ due to underlying error <SSL_connect returned=1 errno=0 state=error: wrong version nu
mber (https://rubygems.org/specs.4.8.gz)>

Retrying fetcher due to error (3/4): Bundler::HTTPError Could not fetch specs from https://rubygems.org/ due to underlying error <SSL_connect returned=1 errno=0 state=error: wrong version nu
mber (https://rubygems.org/specs.4.8.gz)>

Retrying fetcher due to error (4/4): Bundler::HTTPError Could not fetch specs from https://rubygems.org/ due to underlying error <SSL_connect returned=1 errno=0 state=error: wrong version nu
mber (https://rubygems.org/specs.4.8.gz)>

Could not fetch specs from https://rubygems.org/ due to underlying error <SSL_connect returned=1 errno=0 state=error: wrong version number (https://rubygems.org/specs.4.8.gz)>
make: *** [Makefile:7: install] Error 17
```

[解决方式]:

```
# 替换bundle镜像源
bundle config mirror.https://rubygems.org https://mirrors.aliyun.com/rubygems
```

5. 安装超时报错

```
Installing gnuplot 2.6.2
Bundler::HTTPError: Could not download gem from https://mirrors.aliyun.com/rubygems/ due to underlying error <Errno::ECONNREFUSED: Failed to open TCP connection to 90.253.6.207:8080
(Connection refused - connect(2) for "90.253.6.207" port 8080) (https://mirrors.aliyun.com/rubygems/gems/zeitwerk-2.6.5.gem)>
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/rubygems_integration.rb:549:in `rescue in download_gem'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/rubygems_integration.rb:521:in `download_gem'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/source/rubygems.rb:527:in `download_gem'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/source/rubygems.rb:479:in `fetch_gem'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/source/rubygems.rb:165:in `install'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/installer/gem_installer.rb:54:in `install'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/installer/gem_installer.rb:16:in `install_from_spec'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/installer/parallel_installer.rb:186:in `do_install'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/installer/parallel_installer.rb:177:in `block in worker_pool'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/worker.rb:62:in `apply_func'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/worker.rb:57:in `block in process_queue'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/worker.rb:54:in `loop'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/worker.rb:54:in `process_queue'
  /usr/local/share/gems/gems/bundler-2.2.33/lib/bundler/worker.rb:91:in `block (2 levels) in create_threads'

An error occurred while installing zeitwerk (2.6.5), and Bundler cannot continue.

In Gemfile.2:
  activesupport was resolved to 6.1.7, which depends on
    zeitwerk
```

[解决方式]:

安装时间过长，连接冲断，重新运行make install即可解决

### lkp install 遇到的问题

1. 报错，系统不支持

```
[root@master01 lkp-tests]# lkp install
Not a supported system, cannot install packages.
```

[解决方式]:

环境变量中增加 LKP_SRC，路径和LKPPATH一样exportPATH=LKP_PATH 一样 export PATH=LKPATH一样exportPATH =PATH:/home/lj/lkp-tests/sbin:/home/lj/lkp-tests/bin:/home/lj/lkp-tests/sbin:/home/lj/lkp-tests/bin

export LKP_PATH=/home/lj/lkp-tests

export LKP_SRC=/home/lj/lkp-tests

## 2. lkp test 任务创建指导

### 1. 文件介绍

doc/add-testcase.zh.md · Fengguang/lkp-tests - Gitee.com

### 2. 必须的文件

run（可执行脚本）

meta.yaml（介绍项目的详细信息）

jobs 文件夹以及文件夹内需要包含一个与program同名的yaml文件

```
lkp split xxx.yaml # 这个yaml是jobs文件夹里的，在哪里执行这个命令，分割出来的任务就会在哪
lkp run xxxx.yaml # 这个yaml是上一步分割完后生成的yaml
```

## 3. 离线安装指导

### 1.yum源配置

请配置everything的yum源
https://repo.huaweicloud.com/openeuler/openEuler-20.03-LTS/ISO/aarch64/

### 2.gem 配置

去https://gems.ruby-china.com/ 下载以下gem依赖
bundeler 2.2.33, diff-lcs 1.5.0, minitest 5.15.0 concurrent-ruby 1.1.10, docile 1.4.0, rchardet 1.8.0,
gnuplot 2.6.2, parallel 1.22.1, public_suffix 4.0.7, regexp_parser 2.6.0, rexml 3.2.5, ast 2.4.2,
rainbow 3.1.1, rspec-support 3.12.0, ruby-progressbar 1.11.0, unicode-display_width 2.3.0,
git 1.7.0, simplecov_json_formatter 0.1.4, simplecov-html 0.12.3, rspec-core 3.12.0, rspec-expectations 3.12.0,
rspec-mocks 3.12.0, i18n 1.12.0, builder 3.2.4, sync 0.5.0, tzinfo 2.0.5, rspec 3.12.0, ci_reporter 2.0.0,
ci_reporter_rspec 1.0.0, parser 3.1.2.1, tins 1.31.1, term-ansicolor 1.7.1, rubocop 1.12.1, simplecov 0.21.2,
simplecov-rcov 0.3.1
将以上依赖放到 /usr/share/gems/gems
并执行gem install --local 安装以上依赖

### 3.环境变量 配置

export PATH=$PATH:lkptest路径/lkp-tests/sbin:lkptest路径/lkp-tests/bin:lkptest路径/lkp-tests/sbin:lkptest路径/lkp-tests/bin
export LKP_PATH=lkptest路径/lkp-tests
export LKP_SRC=lkptest路径/lkp-tests

### 4.测试是否安装成功

```
lkp help
lkp install
```