

**facebook**

# Kernel Upgrades at Facebook

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Production Engineer











**Security**

**Bugs**

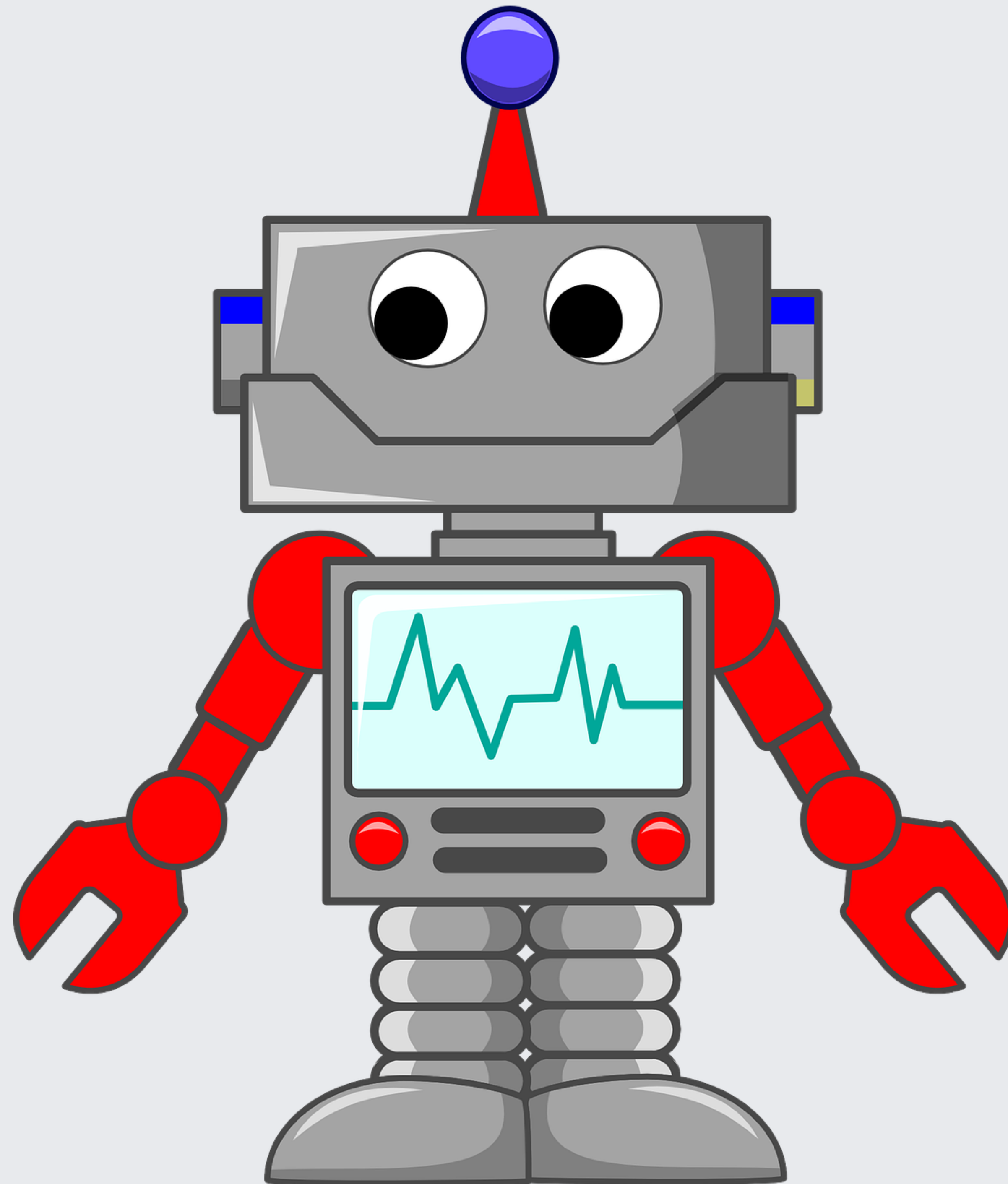
**New Features**

**Performance**











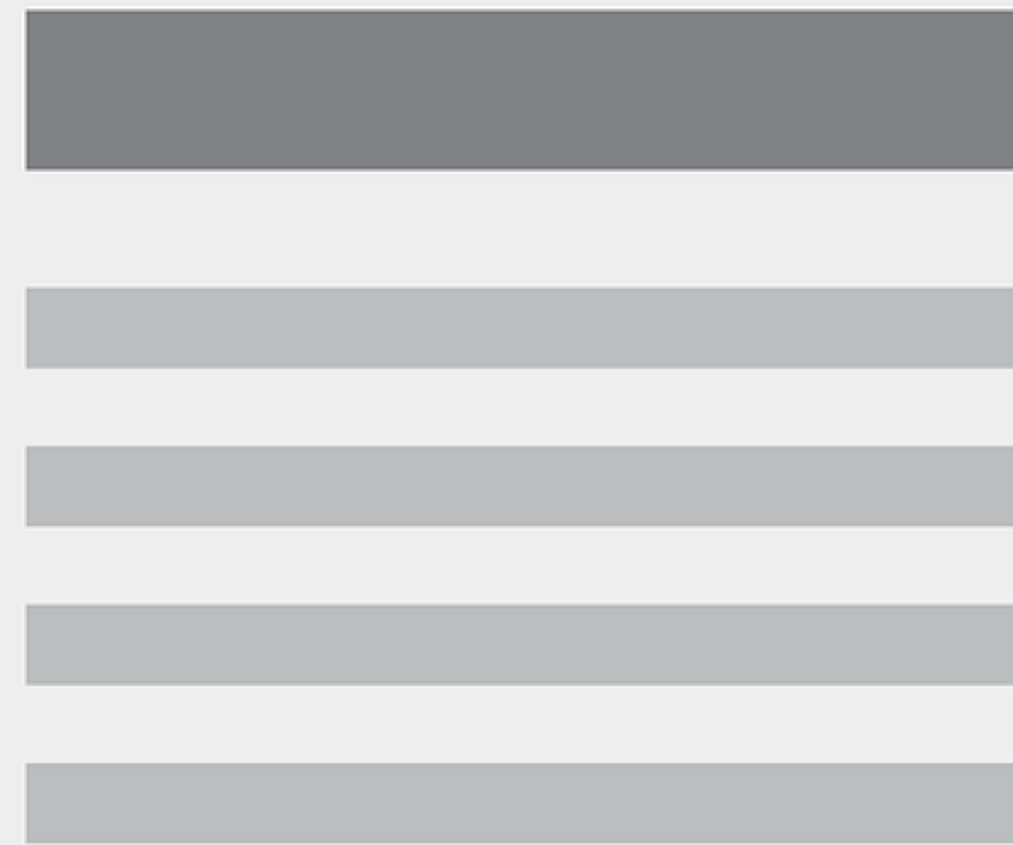
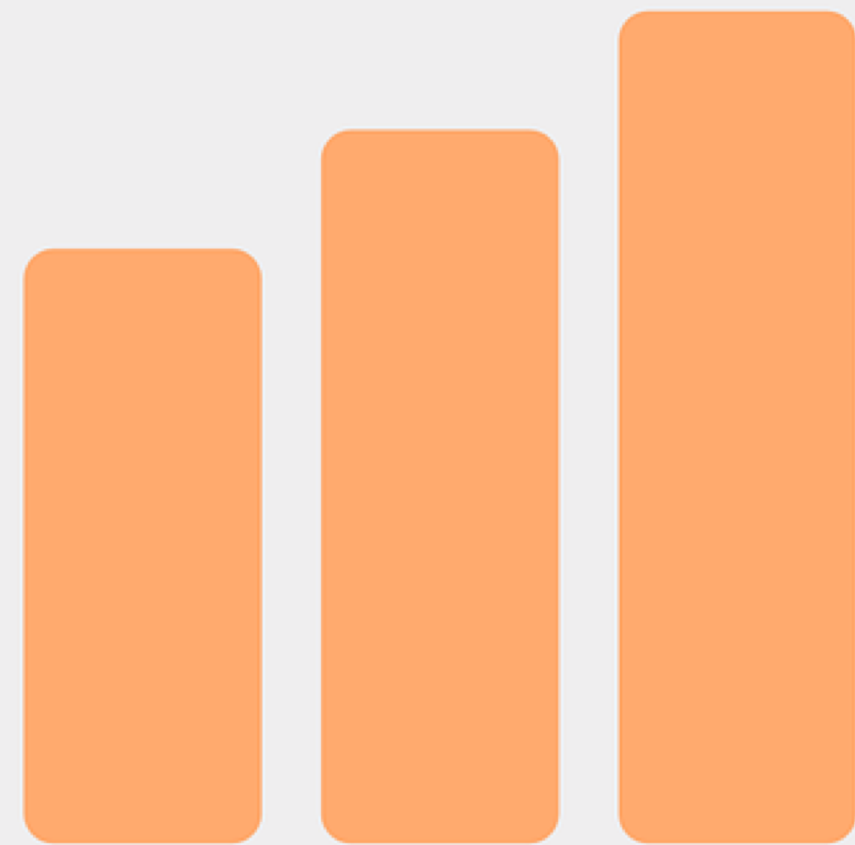
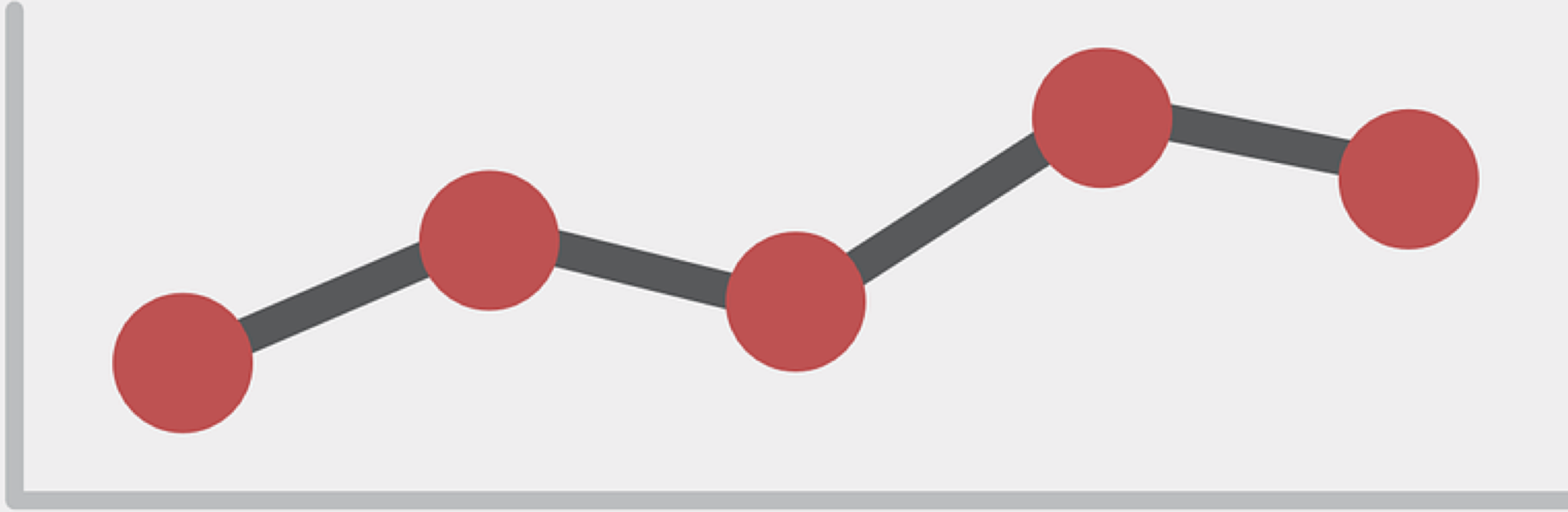
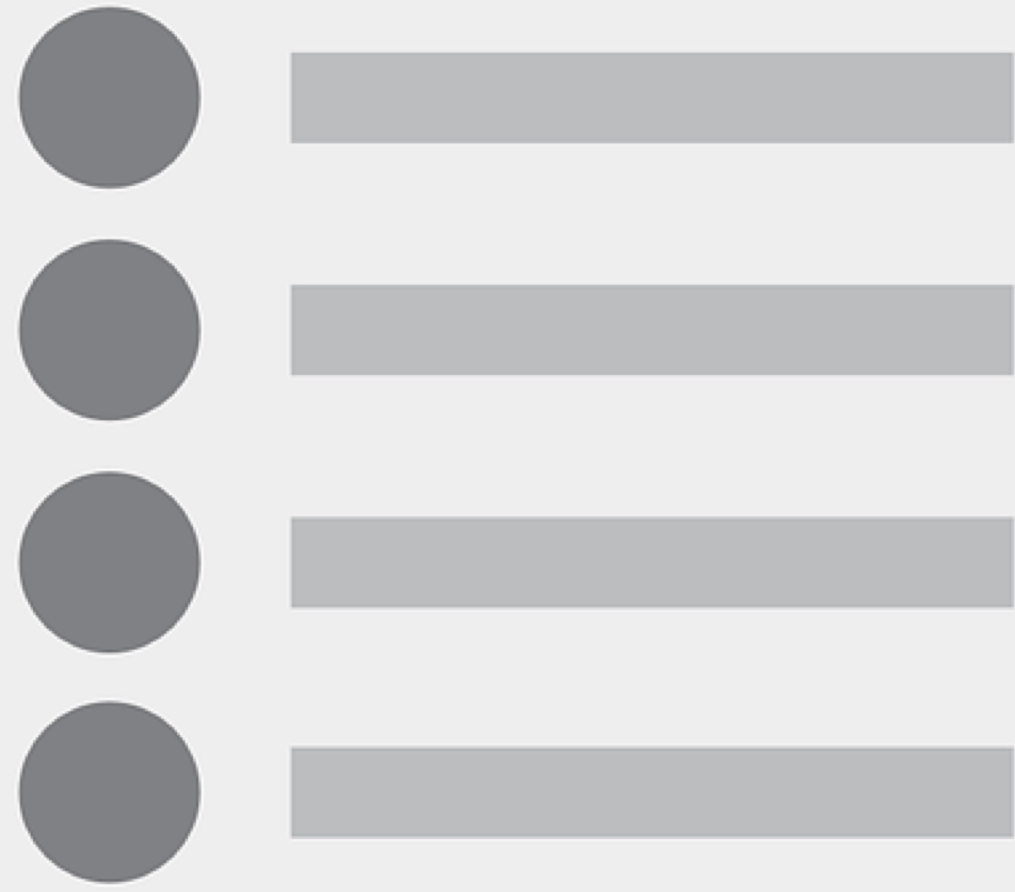
















Max input: 230 V  
© Colliwood



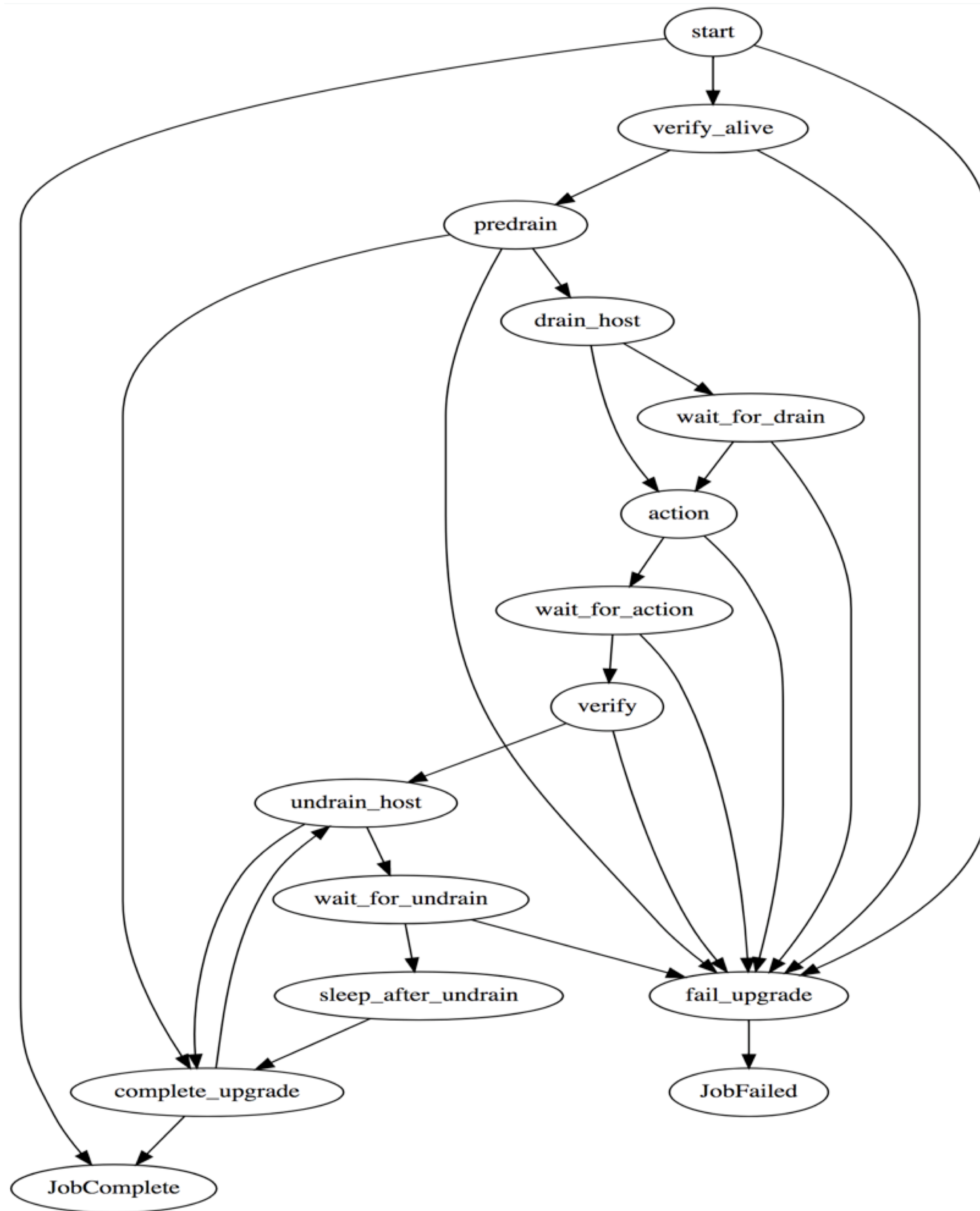
# Kernel Upgrade Framework



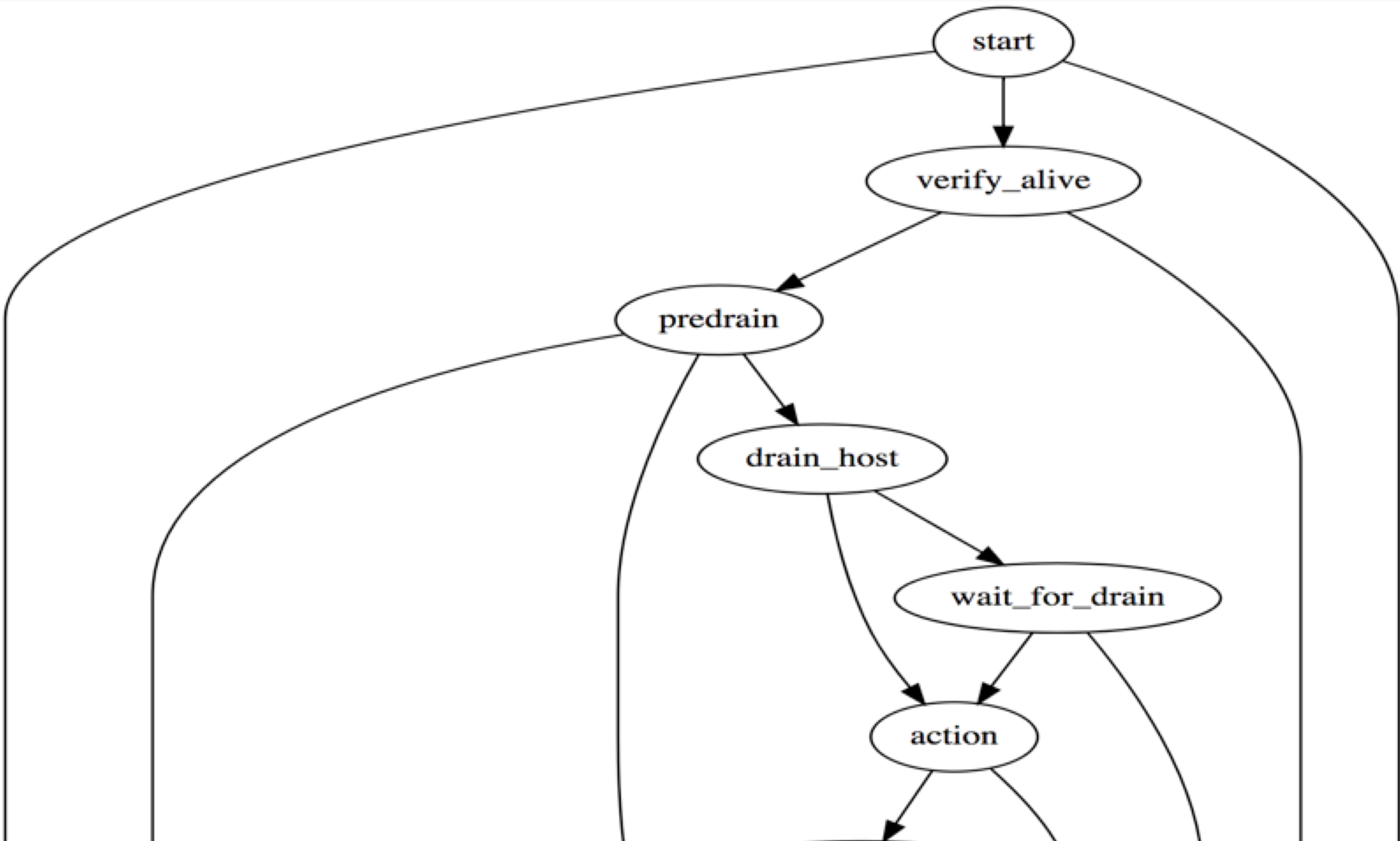
# Kernel Upgrade Framework

- continuously running jobs
- parallelism
- unattended
- alarms
- pause/continue/disable
- sharding based on different kernel versions

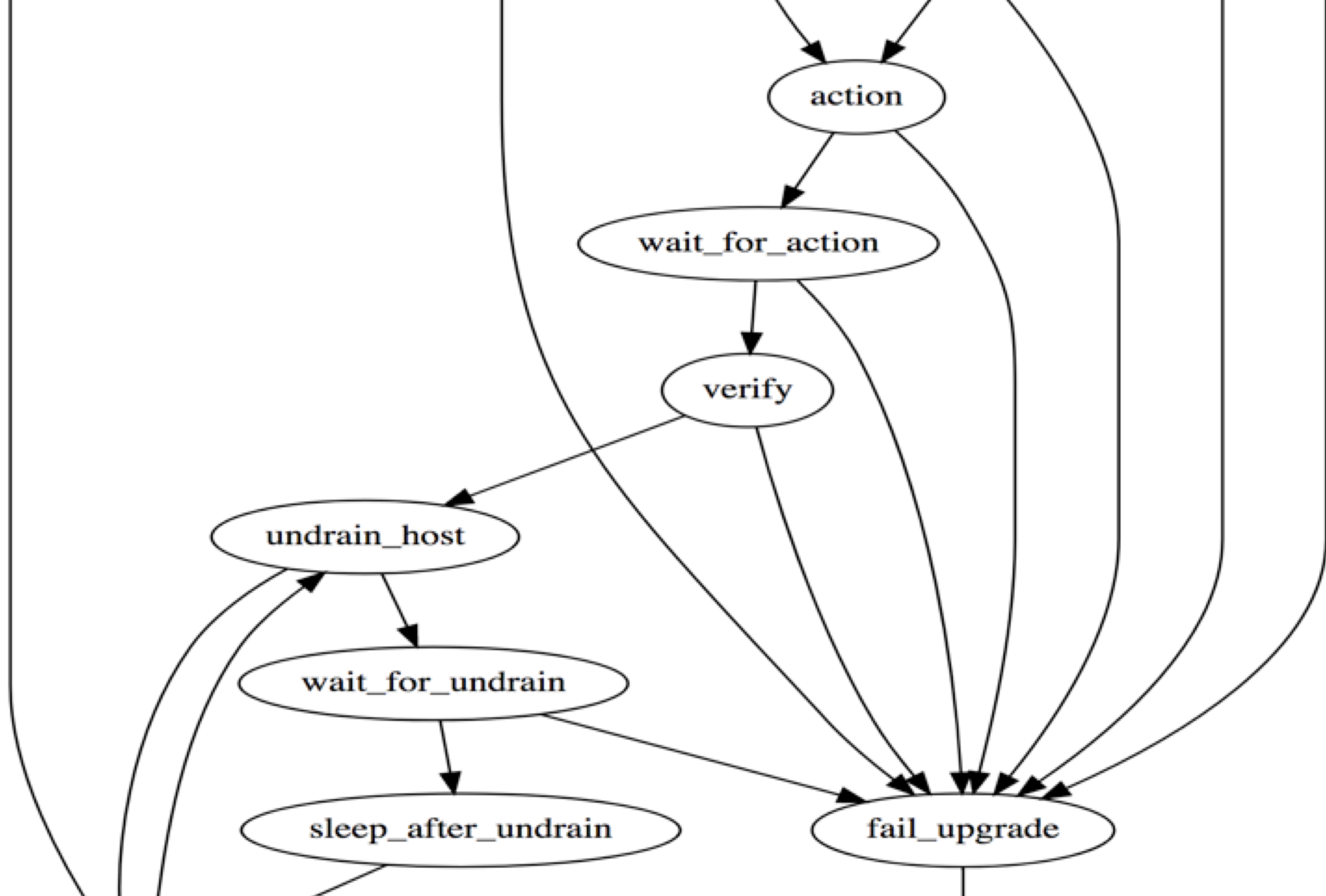








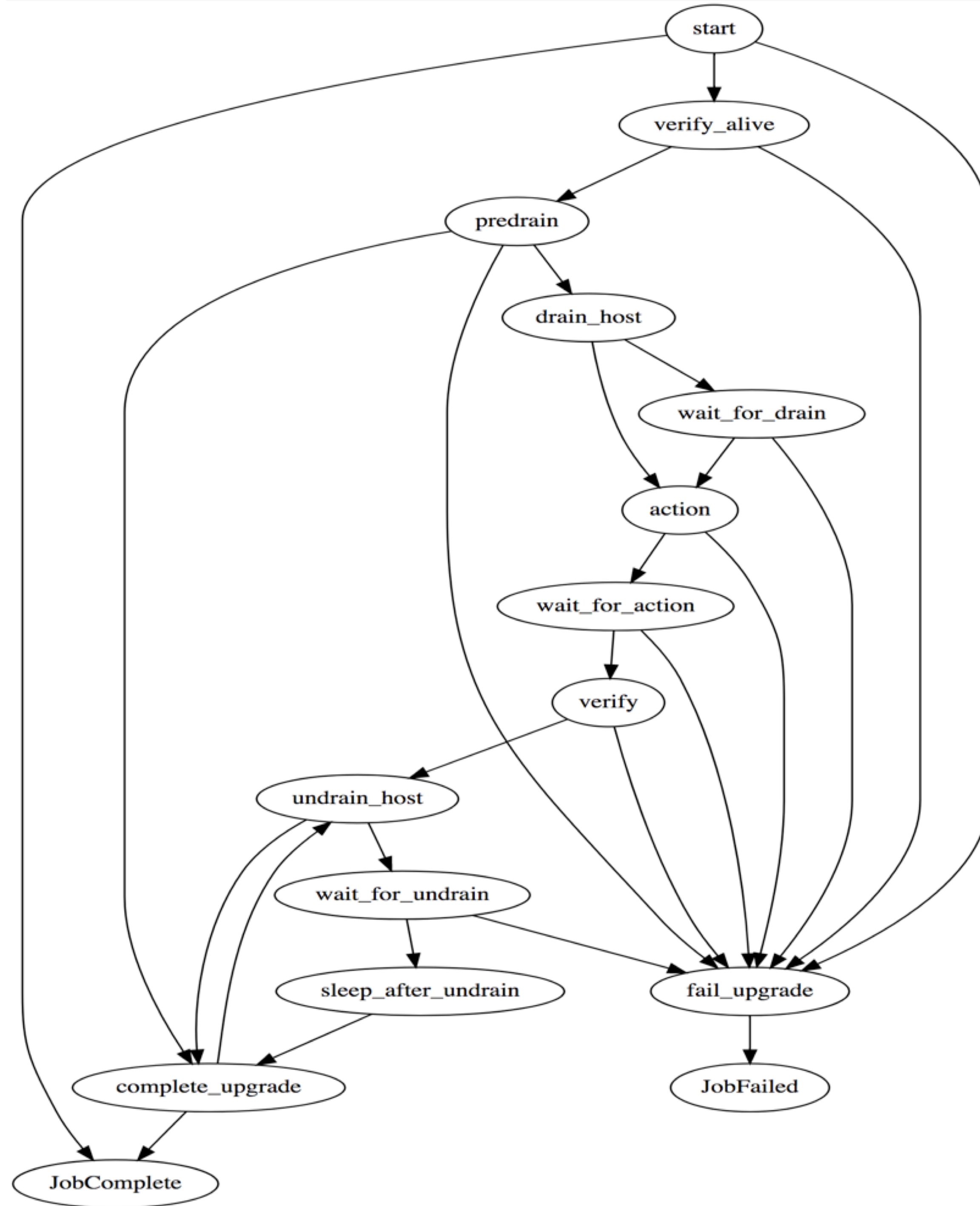














```
UpgradeGroup (  
  name="{hostprefix}",  
  #generator="default",  
  #constraints=[],  
  #parallelism="serial",  
  #minhosts=1,  
  #atonce=0.001,  
  #shards=[],  
)
```



# constraints

```
[  
  ["sys.foo.dc1.1"],  
  ["sys.foo.dc1.2"],  
  ["sys.foo.dc1.3"]  
]
```



# constraints

```
[  
  ["sys.foo.dc1.1", "sys.foo.dc1.2"]  
]
```



# constraints

```
[  
  ["sys.foo.dc1.1", "sys.foo.dc1.2"],  
  ["sys.bar.dc2.1", "sys.bar.dc2.2"]  
]
```



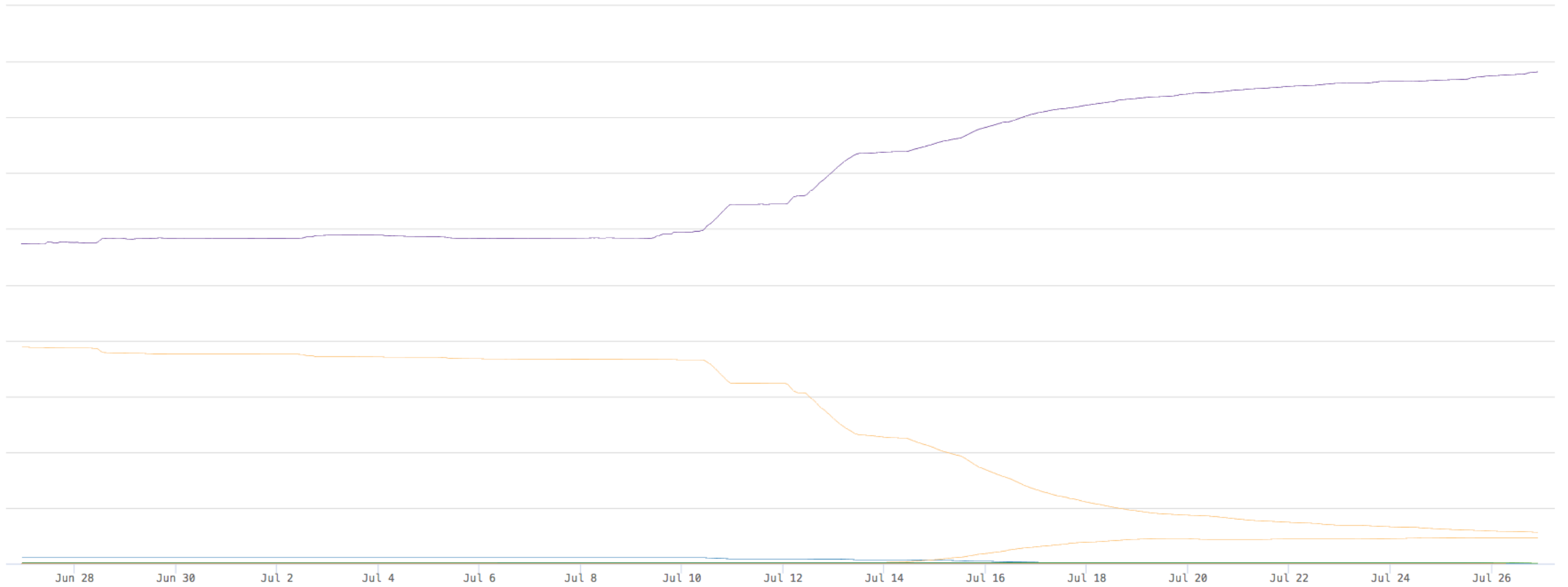
# example config

```
UpgradeGroup (  
  name="{foobar}",  
  parallelism="cluster",  
  atonce=0.01,  
  shards=[  
    [0.01, "v4.11-fb:X86:STANDARD:RC"],  
    [0.05, "v4.16-fb:X86:STANDARD:OFFICIAL"],  
  ],  
  passthrough = {  
    "action_timeout": 700,  
  }  
)
```



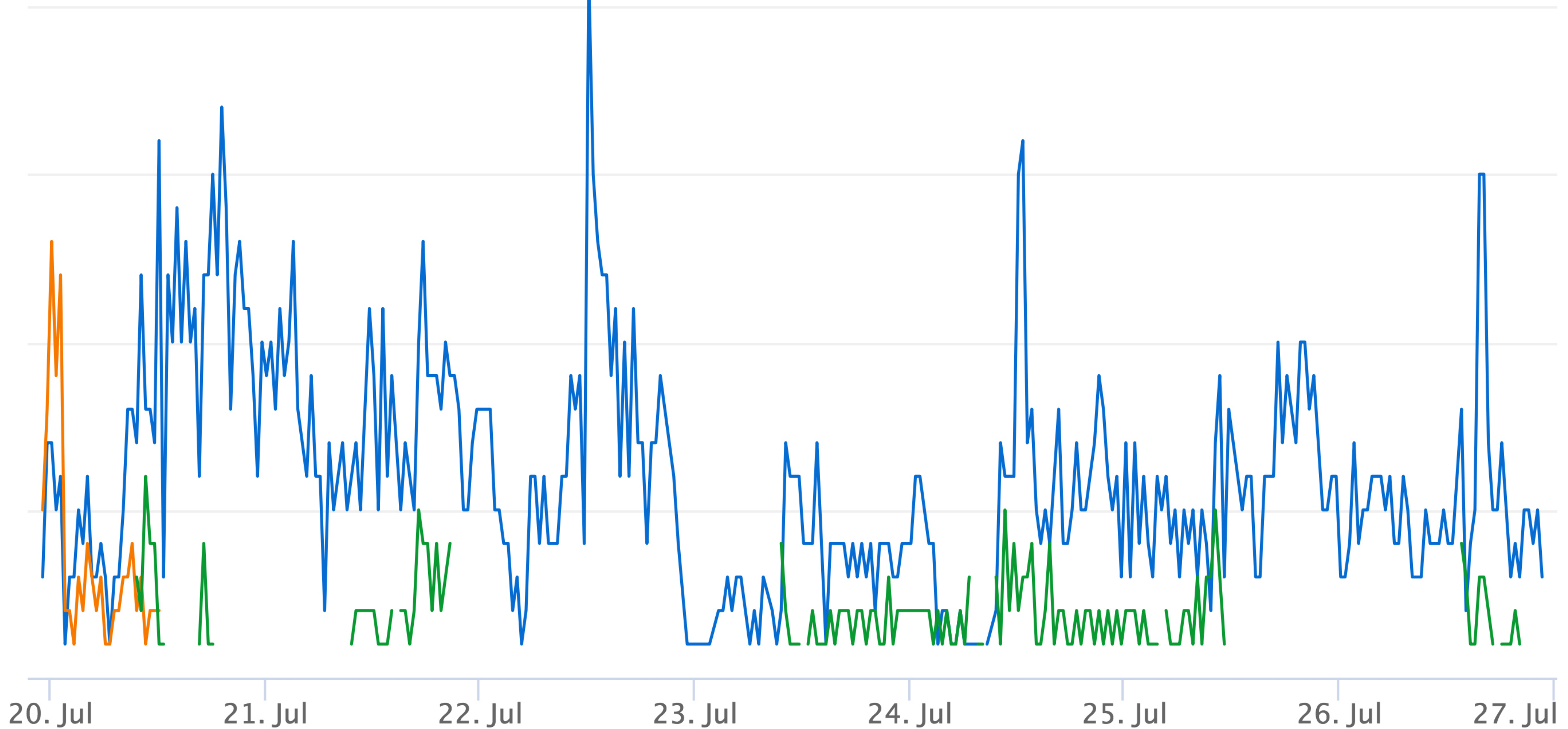






kernel\_version.ldb::4.0.9-68\_fbk12\_4058\_gd84fdb3    kernel\_version.ldb::4.11.3-45\_fbk11\_3602\_gd67c71c    kernel\_version.ldb::4.11.3-61\_fbk16\_3934\_gd064a3c    kernel\_version.ldb::4.11.3-67\_fbk17\_4093\_g2bf19e7a0b95  
kernel\_version.ldb::4.11.3-70\_fbk18\_4116\_g1cf3f1a0ca4f    kernel\_version.ldb::4.6.7-38\_fbk8\_2591\_gf27713f    kernel\_version.ldb::4.6.7-42\_fbk9\_2750\_g0332bba    kernel\_version.ldb::4.6.7-45\_fbk10\_2892\_gae87f68  
kernel\_version.ldb::4.6.7-51\_fbk13\_3387\_g5c17f83    kernel\_version.ldb::4.6.7-53\_fbk14\_3450\_gdcef56d    kernel\_version.ldb::4.6.7-56\_fbk15\_3477\_ga310258    kernel\_version.ldb::4.6.7-58\_fbk16\_3483\_g6d56356  
kernel\_version.ldb::4.6.7-60\_fbk17\_3521\_g32620b0    kernel\_version.ldb::4.6.7-67\_fbk19\_3578\_gd30adc4    kernel\_version.ldb::4.6.7-69\_fbk20\_3582\_g574d175    kernel\_version.ldb::4.6.7-73\_fbk21\_3608\_gb5941a6





— `["/usr/local/bin/kernelctl", "install", "-q", "-p", "4.6.7-73_fbk21_3608_gb5941a6"]` count

— `["/usr/local/bin/kernelctl", "install", "-q", "-p", "4.11.3-70_fbk18_4116_g1cf3f1a0ca4f"]` count

— `["/usr/local/bin/kernelctl", "install", "-q", "-p", "4.11.3-67_fbk17_4093_g2bf19e7a0b95"]` count

**We want you to upgrade kernels**



**Thank You**