

# Best Practices - Fedora Configuration

## Question

What backend configuration should I use?

## Best Practice 1

For production use, we recommend a [MySQL or PostgreSQL](#) backend. For development, testing and trial a simple file backend is adequate.

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## Question

Is there advice on best practices for customizing Fedora 4 configuration files?

## Best Practice 1

One recommended practice is to store modified configuration files outside of the unpacked war file.

This is an example of production Fedora JAVA\_OPTS:

```
JAVA_OPTS="-Dfile.encoding=UTF-8 \  
-Dfcrepo.home=/mnt/data/fcrepo \  
-Dfcrepo.spring.configuration=file:/etc/fcrepo/fcrepo-config.xml \  
-Dfcrepo.modeshape.configuration=file:/etc/fcrepo/repository.json \  
-Dfcrepo.activemq.configuration=file:/etc/fcrepo/activemq.xml \  
-Dfcrepo.auth.webac.authorization=/etc/fcrepo/root-authentication.ttl \  
-Dfcrepo.spring.audit.configuration=file:/etc/fcrepo/audit.xml \  
-Dlogback.configurationFile=/etc/fcrepo/logback.xml \  
-Dfcrepo.modeshape.index.directory=modeshape.index \  
-Dfcrepo.binary.directory=binary.store \  
-Dfcrepo.activemq.directory=activemq \  
-Dcom.arjuna.ats.arjuna.common.ObjectStoreEnvironmentBean.default.objectStoreDir=arjuna.common.object.store \  
-Dcom.arjuna.ats.arjuna.objectstore.objectStoreDir=arjuna.object.store \  
-Dnet.sf.ehcache.skipUpdateCheck=true \  
-Dfcrepo.audit.container=/audit \  
  
# GC Configuration  
-XX:+UseConcMarkSweepGC \           # for smaller (< 4 GB) heaps  
-XX:+CMSClassUnloadingEnabled \ # for use with UseConcMarkSweepGC  
-XX:+UseG1GC \                       # for larger (> 4 GB) heaps  
-XX:ConcGCThreads=5 \  
-XX:MaxGCPauseMillis=200  
-XX:ParallelGCThreads=20 \  
  
# Memory usage  
-XX:MaxMetaspaceSize=512M \  
-Xms1024m \                          # minimum heap size  
-Xmx2048m"                          # maximum heap size"
```

You will see that all of the configuration files are stored outside of the unpacked war file. In this case, that is `/etc/fcrepo`, but it could be any place that makes sense for your system.

All of these configuration files may be customized, and by placing them in an administrator-controlled directory, any local changes are not overwritten when re-deploying a war file.

At a minimum, it is recommended that production deployments of Fedora store at least the following configuration files separately, and if you customize these at all, you should absolutely do this:

```
* fcrepo-config.xml (this is the central config for dependency-injected Fedora Spring beans)
* repository.json (this is the central config for Modeshape, and you should control that)
* activemq.xml (common update: turn the topic into a queue)
* root-authentication.ttl (if you are using webac)
* logback.xml (common update: direct logging to /var/log/fcrepo/fcrepo.log rather than catalina.out)
```

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## Question

How do I configure logging output?

## Best practice 1

Logging can be configured with a `logback.xml` file. For example, if you would like output to go to `/var/log/fcrepo/fcrepo.log` while rotating that log when it exceeds 20MB, this would be a possible configuration:

## logback.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE configuration>
<configuration>
  <property name="FCREPO_LOG_PATH" value="/var/log/fcrepo/fcrepo${logfile.extension:-.log}"/>
  <appender name="FILE" class="ch.qos.logback.core.rolling.RollingFileAppender">
    <file>${FCREPO_LOG_PATH}</file>
    <encoder>
      <pattern>%d{dd-MMM HH:mm:ss.SSS} [%thread] %-5level %logger{35} - %msg %n</pattern>
    </encoder>

    <rollingPolicy class="ch.qos.logback.core.rolling.FixedWindowRollingPolicy">
      <maxIndex>5</maxIndex>
      <minIndex>1</minIndex>
      <fileNamePattern>${FCREPO_LOG_PATH}.%i.gz</fileNamePattern>
    </rollingPolicy>

    <triggeringPolicy class="ch.qos.logback.core.rolling.SizeBasedTriggeringPolicy">
      <maxFileSize>20MB</maxFileSize>
    </triggeringPolicy>
  </appender>

  <logger name="org.fcrepo.auth" additivity="false" level="${log.fcrepo.auth:-null}">
    <appender-ref ref="FILE"/>
  </logger>

  <logger name="org.fcrepo.http.api" additivity="false" level="${log.fcrepo.http.api:-null}">
    <appender-ref ref="FILE"/>
  </logger>

  <logger name="org.fcrepo.http.commons" additivity="false" level="${log.fcrepo.http.commons:-null}">
    <appender-ref ref="FILE"/>
  </logger>

  <logger name="org.fcrepo.jms" additivity="false" level="${log.fcrepo.jms:-null}">
    <appender-ref ref="FILE"/>
  </logger>

  <logger name="org.fcrepo.kernel" additivity="false" level="${log.fcrepo.kernel:-null}">
    <appender-ref ref="FILE"/>
  </logger>

  <logger name="org.fcrepo" additivity="false" level="${log.fcrepo:-INFO}">
    <appender-ref ref="FILE"/>
  </logger>

  <logger name="org.apache.activemq" additivity="false" level="WARN">
    <appender-ref ref="FILE"/>
  </logger>

  <root additivity="false" level="WARN">
    <appender-ref ref="FILE"/>
  </root>
</configuration>
```

If you customize this file, you should store it outside of the unpacked `fcrepo.war` directory by adding this to your `JAVA_OPTS`: `-Dlogback.configurationFile=/etc/fcrepo/logback.xml`. Otherwise, when the application is re-deployed, your customizations will be lost.