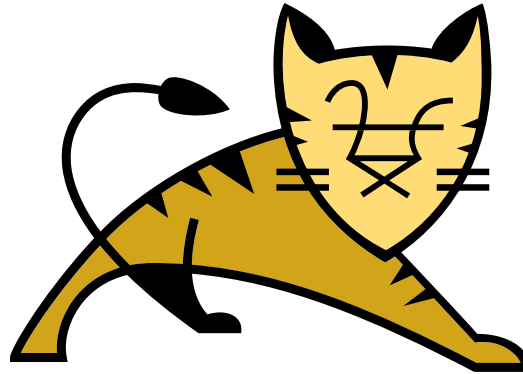


Splitting Your Tomcat Installation

For Easier Upgrades and Downgrades



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QR for Slides:



Catalina



Catalina

- Comprises Tomcat's core services
 - Service, Engine, and Host
 - Authentication, Authorization, Realms
 - Application lifecycle
 - Session Management, Clustering

Simple Deployments

- Unpack apache-tomcat-x.y.z.[arc]
- Customize conf/server.xml
- Drop WAR files into webapps/
- bin/startup.[ext]

Simple Deployments

- All configuration is in conf/
- This is relative to the installation directory
 - e.g. /opt/apache-tomcat/9.0.35/
- This installation directory is known as CATALINA_HOME
 - ...even if you didn't know that

Simple Deployments

- There is another directory / concept:
 - CATALINA_BASE
- For simple deployments, they are the same
 - CATALINA_BASE = CATALINA_HOME

Catalinas

- CATALINA_HOME
 - Server scripts
 - Server binary artifacts

Catalinas

- CATALINA_BASE
 - Custom scripts (bin/setenv.sh)
 - Configuration for the running server (conf/)
 - Deployed applications (webapps/)
 - Logs (logs/)
 - Work space (work/ and temp/)

Catalinas

- Many files in CATALINA_BASE are optional
 - Override those in CATALINA_HOME
 - e.g. conf/context.xml
- Some files are *required* in CATALINA_BASE
 - conf/server.xml
 - conf/catalina.policy (if using a SecurityManager)
 - conf/web.xml

Exceptions

- Some Exceptions may be Surprising
- Only in CATALINA_HOME
 - bin/setclasspath.sh
 - endorsed/ (special Java libraries)
 - bin/bootstrap.jar

Why?

- This complexity gives you lots of freedom
 - Multiple instances running from a single install
 - Easier upgrades
 - “Downgrades” are now possible
 - (Distinct from a “rollback”)

Why

- Multiple Instances
 - Process isolation
 - Security boundary
 - Different JVM configurations (or JVMs!)
 - More flexible maintenance

Splitting your Installation

- RUNNING.txt calls this “Advanced Configuration”
- Install Tomcat e.g. /opt/apache-tomcat-x.y.z
- `$ export CATALINA_HOME=/opt/apache-tomcat-x.y.z`

Splitting your Installation

- Create CATALINA_BASE
 - \$ mkdir -p ~/tomcats/tomcat-a
 - \$ export CATALINA_BASE=~/tomcats/tomcat-a
 - \$ cd \${CATALINA_BASE}
 - \$ mkdir -p conf logs temp webapps work

Splitting your Installation

- Configure Tomcat
 - `conf/server.xml`, `conf/web.xml`,
`conf/catalina.properties`¹, `conf/tomcat-users`¹
- Install web applications in `webapps/`
- `CATALINA_HOME/bin/makebase.[sh|bat]`

¹ If required for your environment

Launching your Instance

- Ensure CATALINA_HOME and CATALINA_BASE environment variables are set
- `$ CATALINA_HOME/bin/startup.sh`

Windows Environments

- Everything is the same
 - .bat instead of .sh
 - \ instead of /

Adding another Instance

- Tomcat is already installed
 - Use the same CATALINA_HOME
- Make another CATALINA_BASE
 - `$ mkdir -p ~/tomcats/tomcat-b`
 - etc.
- `$ CATALINA_HOME/bin/startup.sh`

Upgrading

- Stop Tomcat
 - `$ CATALINA_HOME/bin/shutdown.sh`
- Install new Tomcat to `/opt/apache-tomcat-new`
 - `$ export CATALINA_HOME=/opt/apache-tomcat-new`
- Start Tomcat
 - `$ CATALINA_HOME/bin/startup.sh`

Downgrading

- Stop Tomcat
 - `$ CATALINA_HOME/bin/shutdown.sh`
- Pick old Tomcat to run
 - `$ export CATALINA_HOME=/opt/apache-tomcat-old`
- Start Tomcat
 - `$ CATALINA_HOME/bin/startup.sh`

Advantages

- Upgrades, downgrades do not disturb config
 - Effective conf/server.xml stays the same
 - Web applications do not need to be relocated

Caveats

- Configurations are not compatible across major releases
 - Tomcat 8.5 config may not work on Tomcat 9
- Ports must be changed
 - Service shutdown port
 - Connector port(s)

Caveats

- New configuration options, defaults require edits
 - Your `conf/server.xml` may be missing new things

*NIX-based Services

- Basically, everything is the same
 - Ensure CATALINA_HOME is set
 - Ensure CATALINA_BASE is set
 - Run startup.sh or catalina.sh [start|run]

Windows Services

- Must first install procrun as a Windows Service
 - Ensure CATALINA_HOME is set
 - Ensure CATALINA_BASE is set
 - C:> %CATALINA_HOME%\bin\service.bat install tomcat-a
- Repeat for each separate instance

Windows Service

- Upgrading
 - Run `CATALINA_HOME\bin\tomcat9.exe //ES//tomcat-a`
 - Manually change value for `catalina.home` system property
 - Restart service

Windows Services

- Upgrading without GUI
 - Dump config
 - C:> %CATALINA_HOME%\bin\tomcat9.exe //PS//tomcat-a > tomcat-a.bat
 - Edit tomcat-a.sh
 - Modify CATALINA_HOME
 - ... and anything else you want to change

Windows Services

- Update Service

- C:> tomcat-a.bat

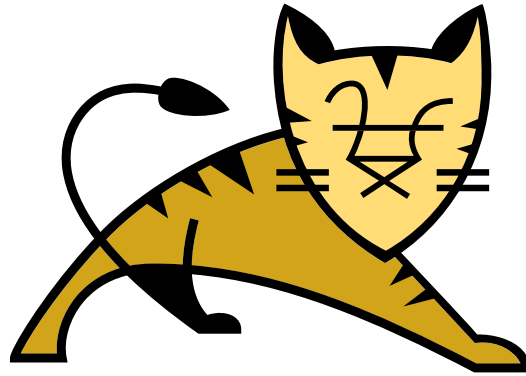
- Replace Service

- Delete service

- C:> %CATALINA_HOME%\bin\tomcat9.exe //DS//tomcat-a

- Recreate Service

- C:> %CATALINA_HOME%\bin\tomcat9.exe //IS//tomcat-a



Questions



[https://people.apache.org/~schultz/presentations/ApacheCon NA 2020/Splitting Your Tomcat Installation.pdf](https://people.apache.org/~schultz/presentations/ApacheCon%20NA%202020/Splitting%20Your%20Tomcat%20Installation.pdf)
Sample code available in the same directory.