Run a Minecraft server using Spigot

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RITlug, 2016-2017
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Introduction

So what's the big deal?

- Minecraft is the world's [second best-selling video game](#) of all-time
  - 122+ million purchased accounts
- What's after single player?

- Most popular multiplayer server software is **[Spigot](#)**
  - Open source Java project: Run a server, extend with plugins
  - 100,000+ Spigot servers in existence today
  - Stable and flexible option for running a Minecraft server

Compiling Spigot

Getting BuildTools

- *Legal note*: Must build / compile Spigot yourself from source code
  - BuildTools makes this easier
- **Install prerequisites**:
  - *Fedora*: `$ sudo dnf install java-1.8.0-openjdk git`
  - *CentOS / RHEL-based derivatives*: `$ sudo yum install java-1.8.0-openjdk git`
- **Download BuildTools** from the [Spigot Jenkins](#)
  - https://hub.spigotmc.org/jenkins/job/BuildTools/
- Make **git line endings consistent** with following command:
  - `$ git config --global --unset core.autocrlf`
- Now we're ready to run!

Running BuildTools

- Run BuildTools in the command line:
  - `$ java -jar BuildTools.jar`
  - Generates latest version of Minecraft Spigot server JAR
- A few different JAR files now appear in the directory, such as:
  - `craftbukkit-1.x.x.jar`
  - `spigot-1.x.x.jar`
  - `x.x` represents the current version of Minecraft
- Spigot is a fork of original CraftBukkit with a few performance enhancements
  - Therefore, use Spigot JAR

Starting the server

Introducing the terminal multiplexer

- Time to **run your server**! Variety of methods to do this.
- *Scenario*: You want to run your server on a headless machine. You're connected in a terminal window and run your server. But you need to disconnect. **You need a terminal multiplexer**.

- Introducing `tmux`
  - This presentation covers basics, for more help, see the tmux [cheatsheet](#)
- Create tmux session, write start script, run Spigot server inside tmux session
  - Enables you to keep running your server **even when you're not connected** to your server

Writing the start script

- Simple, two-line Bash script to run your server

  ```
  #!/usr/bin/bash
  java -Xms1024M -Xmx1024M -jar spigot.jar
  ```

- Put this in the same directory as Spigot JAR
- Make script executable
  - `$ chmod +x start.sh`
- Once your script is done, it's time to open tmux

Starting a tmux session

- Create the tmux session where your Minecraft server will run

```
$ tmux new -s minecraft
$ cd /path/to/start.sh
$ ./start.sh
```

- Press CTRL+B, then 'D' to detach from the session when you're done
- Your server will now begin starting up, although you will need to agree to the EULA for the server to start completely

Configure Spigot

A note about configuration

- Many configuration tips and guides available for configuring a Spigot server
  - See the [Spigot Wiki](#) for extended reading
- We cover basic and important configuration tips

- Two files we will be working with:
  - `server.properties`: Vanilla Minecraft server configuration file
  - `spigot.yml`: Spigot server configuration file

server.properties

- **server-ip**
  - Default: <empty>
  - When blank, this assumes the localhost. If your machine does not have multiple IP addresses, leaving this blank is acceptable.
- **server-port**
  - Default: 25565
  - Specify the TCP port that you want your Spigot server to listen on.
- **enable-query**
  - Default: false
  - Set this to true to allow external services to ping your server for information, such as a listing website showing online players and active plugins.

server.properties (con.)

- **query.port**
    - Must be manually entered
    - You should set this UDP port to a different number than your server TCP port to prevent anyone on the Internet from easily finding out information about your server, if you do not wish to share it.
- **max-players**
    - Default: 10
    - Specify the maximum number of players that can play on your server at the same time.
- **motd**
    - Default: A Minecraft Server
    - Change this line to a server name for your Minecraft server that appears on the Multiplayer menu. You can have up to two lines on the menu; to split your MOTD, use the \n escape character.

spigot.yml

- The *spigot.yml* file has default configuration for Spigot server
  - Several options that can be changed
  - If performance is a concern, you can tweak settings to maximize performance on older systems
  - Full Spigot configuration guide can be found on their [wiki](), but will cover some basic configuration options here
- **settings > restart-on-crash**
  - If server crashes, Spigot can auto-restart the server via your start script (useful if running server long-term)
  - Make sure your start script is specified correctly for this setting
- **world-settings > dragon-death-sound-radius**
  - Adjust the range of dragon death sound for all players (default: anyone online will hear dragon death sound if a player slays the dragon)
  - Allows you to set a radius to limit the range of the death noise

spigot.yml (con.)

- **world-settings > anti-xray**
  - Hacks / cheats in Minecraft are plenty, especially x-ray hacks
    - Lets players see through "useless" blocks and find more valuable ones behind them
    - Spigot has its own anti-xray protection built-in to counter this hack
  - Two engine modes: mode 1 and mode 2
  - Mode 1: Lighter protection that's not as effective but conserves resources
  - Mode 2: More computing power but attempts to obfuscate all non-visible blocks on the fly
  - Try playing around with it to find what works best for you and your system
- **world-settings > arrow-despawn-rate**
  - Performance-oriented tweak
  - If you lower default rate for arrows to despawn, you reduce load on server for rendering items
  - When players are frequently using bows and arrows, this is a useful tweak to gain performance back on the system

Plugins

Finding plugins

- Spigot also has rich API for writing plugins / mods
- User-submitted plugins and resources on [Spigot Resource Manager](spigotmc.org/resources)
  - spigotmc.org/resources
- Find plugins that interest you
  - Expands potential of your server
  - Makes it more interesting for players
- Popular plugins:
  - WorldEdit
  - WorldGuard
  - EssentialsX
  - SuperCraftBros
  - And more...

Live demo

See some of the topics of this talk in action in a production server

- To demonstrate the possibilities of what you can do with Minecraft on a Linux system, we will demonstrate a live production server running Spigot
- Will also introduce and explain BungeeCord, an additional tool for linking multiple Spigot servers together

Questions?
Comments?
Concerns?