

# Composer Best Practices *2018*



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<https://packagist.com>

2018?



Delete your lock files

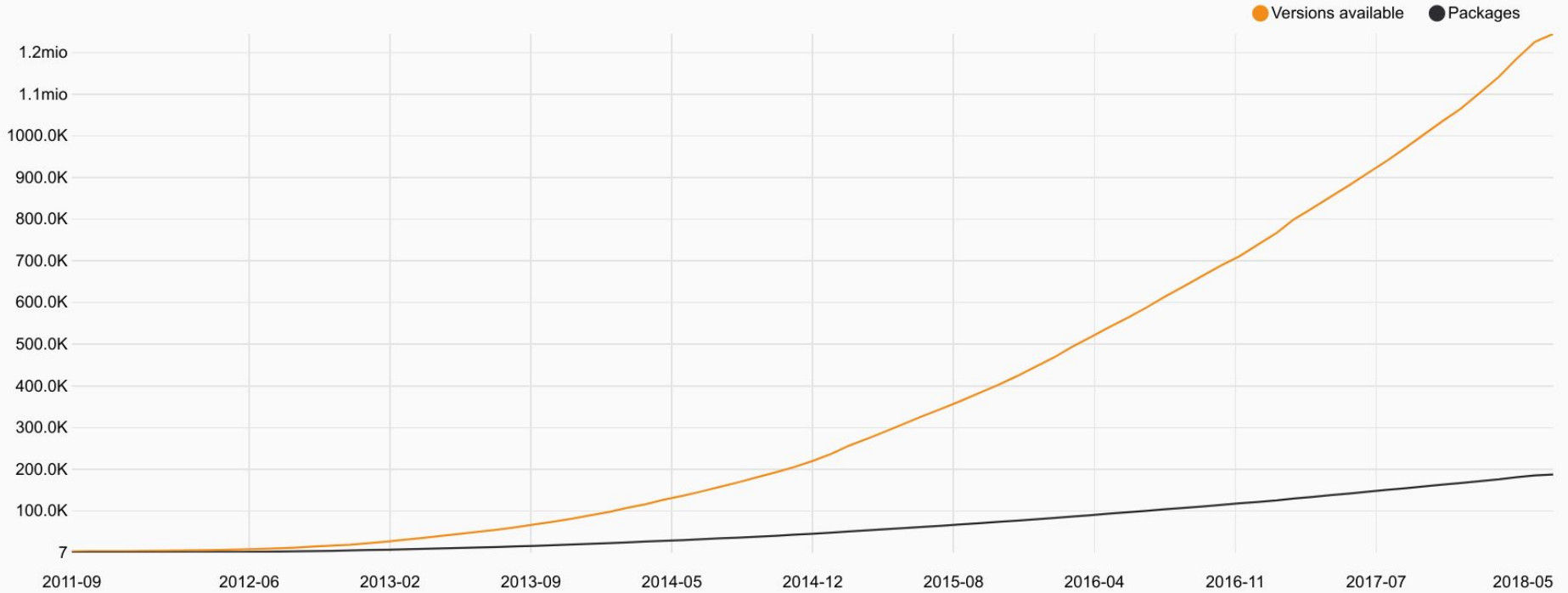
2018?



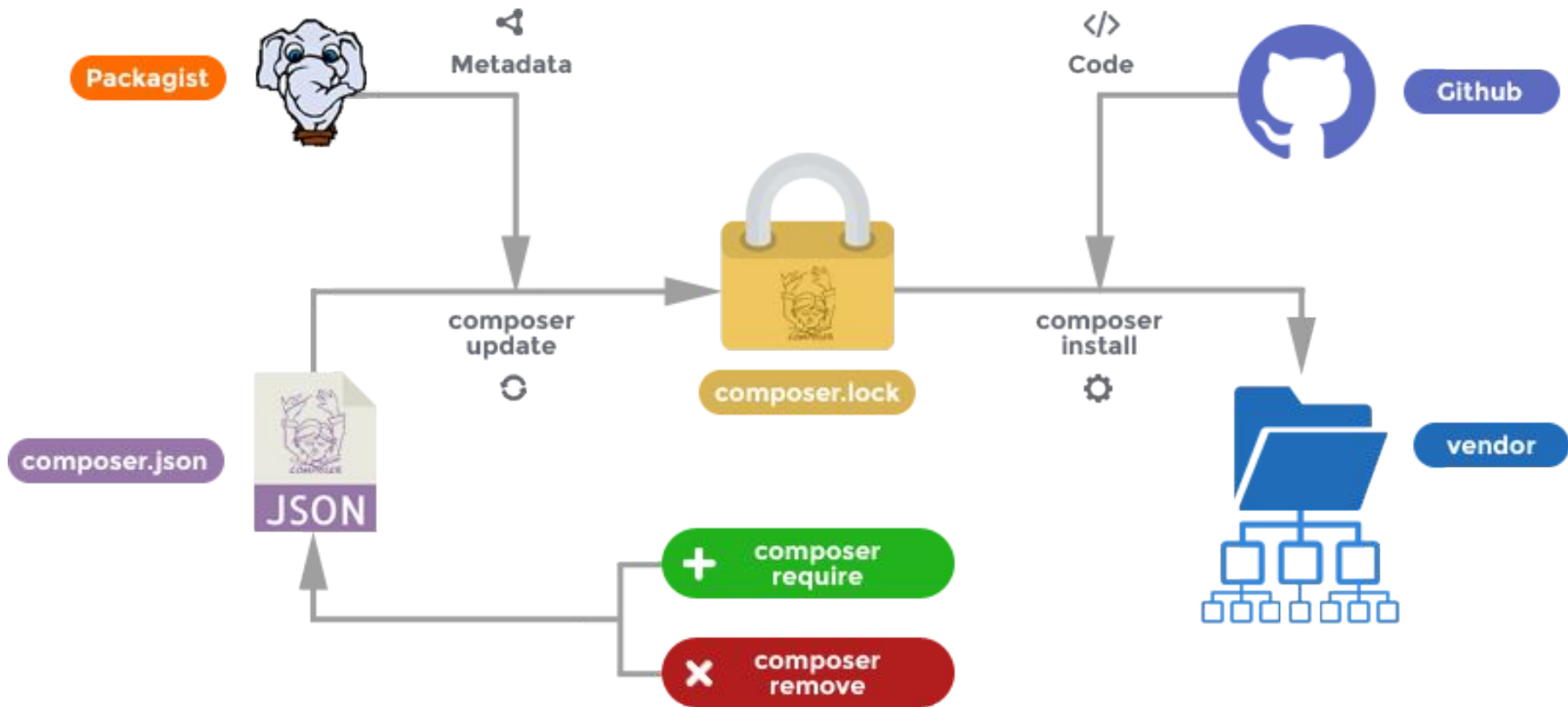
~~Delete your lock files~~

# Composer Ecosystem Reality Update 2018

Packages/versions over time



Best Practices?



Deployment

# Improving your deployment process

- Slow Deployment
  - You will not enjoy deploying
- Unreliable deployment
  - You will be scared to deploy
- You deploy infrequently
  - more work to debug older problems
  - no incentive to improve the process
- Vicious cycle
  - **Reliability and speed** are key to breaking it



# Reduce dependence on external services

- Build Process (move more into this)
  - Install dependencies (Composer, npm, ...)
  - Generate assets (Javascript, CSS, generated PHP code, ...)
  - Create an artifact with everything in it
- Deploy Process (make this as small as possible)
  - Move the artifact to your production machine
    - sftp, rsync, apt-get install
  - Machine dependent configuration
  - Database modifications
  - Start using new version



# Never Deploy without a Lock File

Do not run composer update during deployments

# Reduce dependence on external services

- composer install loads packages from URLs in composer.lock
  - Packagist.org is metadata only
  - *Open-source dependencies could come from anywhere*
- Solutions to unavailability
  - Composer cache in `~/ .composer /cache`
    - Unreliable, not intended for this use
  - Fork every dependency
    - huge maintenance burden
  - Your own Composer repository mirroring all packages
    - e.g. Private Packagist

# composer install performance

- Use `--prefer-dist` to avoid git clones
  - Will always download zip files if possible (default for stable versions)
- Store `~/.composer/cache` between builds
  - How depends on CI product/setup you use

# Autoloader Optimization

- `composer install --optimize-autoloader`
  - `composer dump-autoload --optimize`
- `composer install --optimize-autoloader --classmap-authoritative`
  - `composer dump-autoload --optimize --classmap-authoritative`
- `composer install --optimize-autoloader --apcu-autoloader`
  - `composer dump-autoload --optimize --apcu`

<https://getcomposer.org/doc/articles/autoloader-optimization.md>

# Autoloader Optimization

- *Use this one*  
**composer dump-autoload --optimize --classmap-authoritative**
- Requires PHP7 to be optimal
  - opcache can keep static array definition in shared memory
  - no loading overhead on PHP request startup
- Will not search for classes not in lookup table
  - not useful for development
  - not useful for dynamically generated code (don't do that!)

# It's 2018 - What's new in Composer?

- Current version: 1.6.5 (released May 4, 2018)
  - 22 releases since January 2017
- Bugfixes & Performance Improvements
  - Over 900 issues closed since January 2017 (~250 open)
  - Over 300 pull requests closed since January 2017 (~25 open)
    - Not all bug reports / bugfixes, feature requests, support issues, etc.

# It's 2018 - What's new in Composer?

- Interoperability
  - GitLab API v4
    - released in 1.5.0 in August 2017
  - Bitbucket API v2
    - released in v1.4.0 in March 2017
  - New Git versions
    - v1.4.3 in August 2017
  - Upcoming: GitHub deprecated Services
    - GitHub App for packagist.org



# It's 2018 - What's new in Composer?

- New features
  - usually very small things
  - often not useful for everyone
  
- Let's look at a couple

# New Features

## SPDX 3.0 License Identifier Update

GPL2.0 => GPL2.0-only

GPL2.0+ => GPL2.0-or-later

Packagist now rejects updates with invalid license identifiers now

<https://github.com/composer/spdx-licenses>

# New Features

**`--with-all-dependencies`**

Released in 1.6.0, Jan 2018

# Partial Updates

```
{  "name": "zebra/zebra",  
  "require": {  
    "horse/horse": "^1.0"  }}
```

```
{  "name": "giraffe/giraffe",  
  "require": {  
    "duck/duck": "^1.0"  }}
```

# Partial Updates

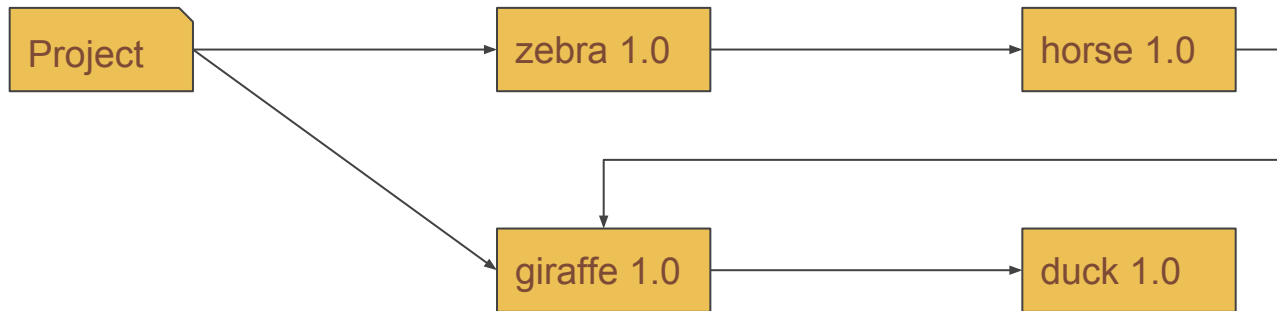
```
{  "name": "horse/horse",  
  "require": {  
    "giraffe/giraffe": "^1.0"  }}
```

```
{  "name": "duck/duck",  
  "require": {}}
```

# Partial Updates

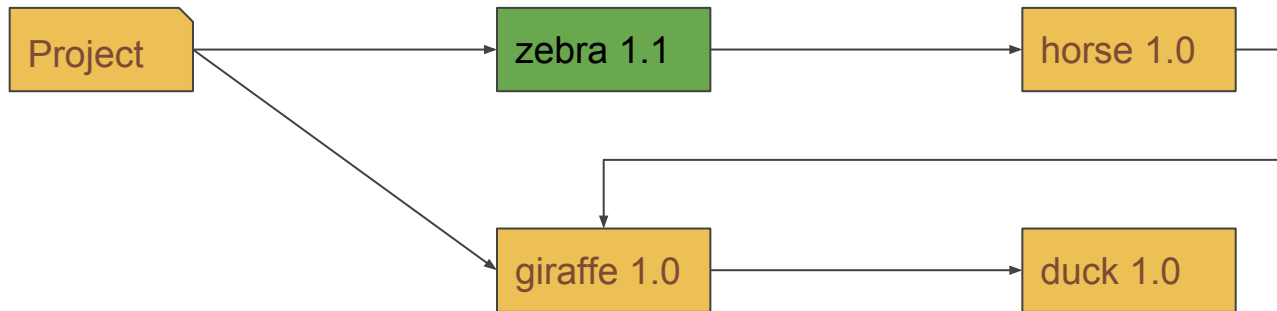
```
{  
  "name": "my-project",  
  "require": {  
    "zebra/zebra": "^1.0",  
    "giraffe/giraffe": "^1.0"  
  }  
}
```

# Partial Updates



Now each package releases 1.1

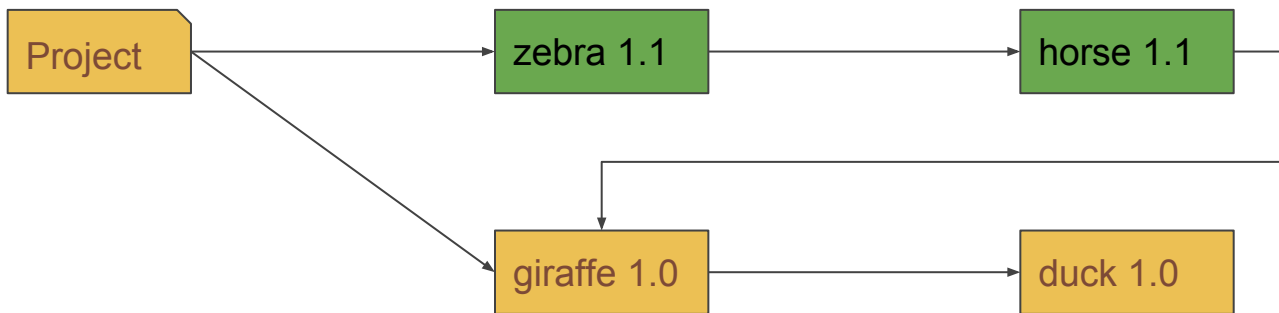
# Partial Updates



```
$ composer update --dry-run zebra/zebra  
Updating zebra/zebra (1.0 -> 1.1)
```

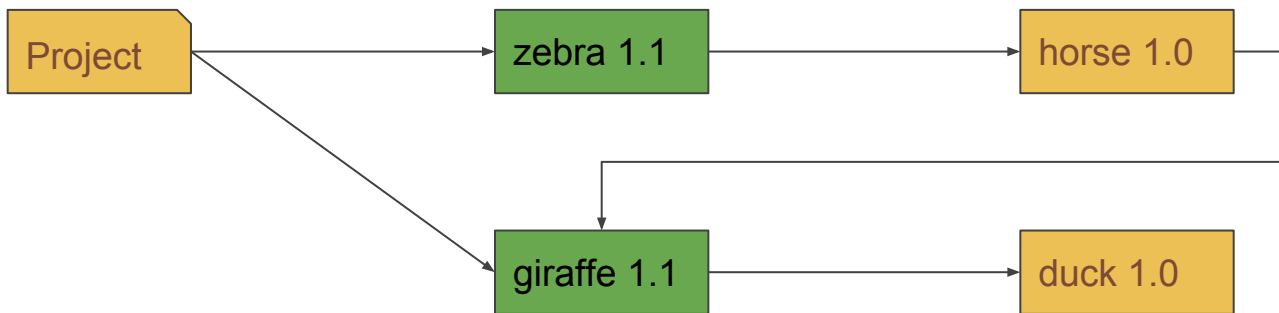


# Partial Updates



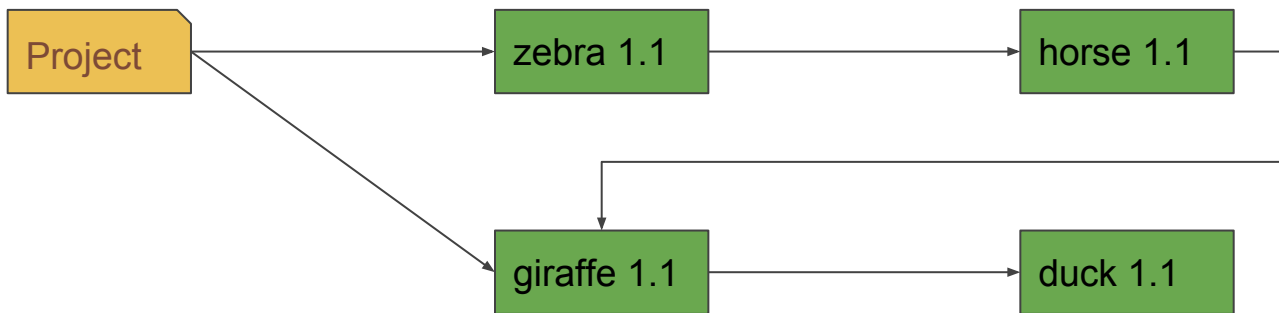
```
$ composer update --dry-run zebra/zebra --with-dependencies  
Updating horse/horse (1.0 -> 1.1)  
Updating zebra/zebra (1.0 -> 1.1)
```

# Partial Updates



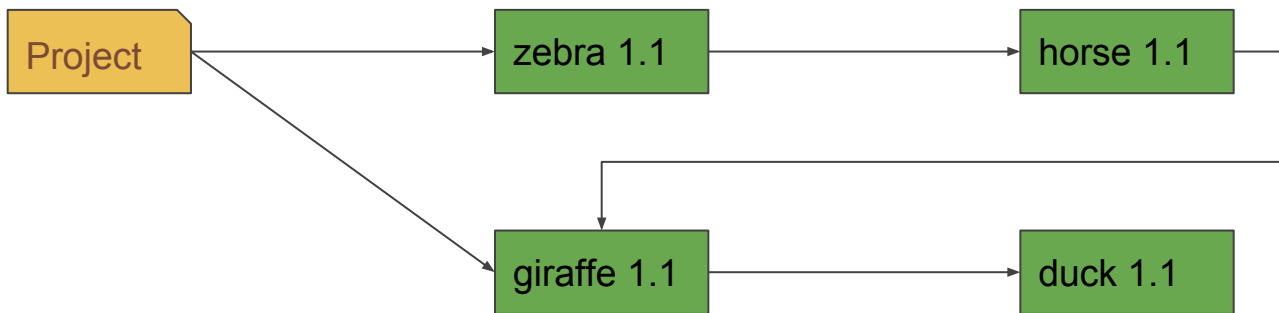
```
$ composer update --dry-run zebra/zebra giraffe/giraffe  
Updating zebra/zebra (1.0 -> 1.1)  
Updating giraffe/giraffe (1.0 -> 1.1)
```

# Partial Updates



```
$ composer update zebra/zebra giraffe/giraffe --with-dependencies
Updating duck/duck (1.0 -> 1.1)
Updating giraffe/giraffe (1.0 -> 1.1)
Updating horse/horse (1.0 -> 1.1)
Updating zebra/zebra (1.0 -> 1.1)
```

# Partial Updates



```
$ composer update zebra/zebra --with-all-dependencies
```

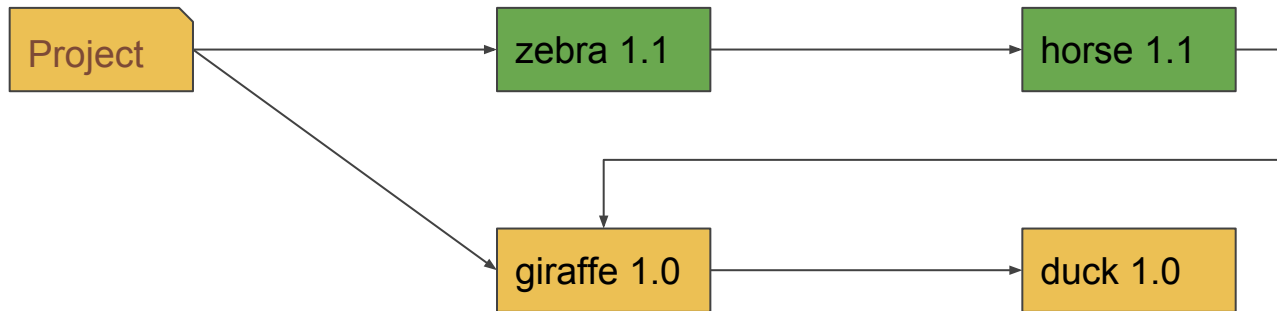
```
Updating duck/duck (1.0 -> 1.1)
```

```
Updating giraffe/giraffe (1.0 -> 1.1)
```

```
Updating horse/horse (1.0 -> 1.1)
```

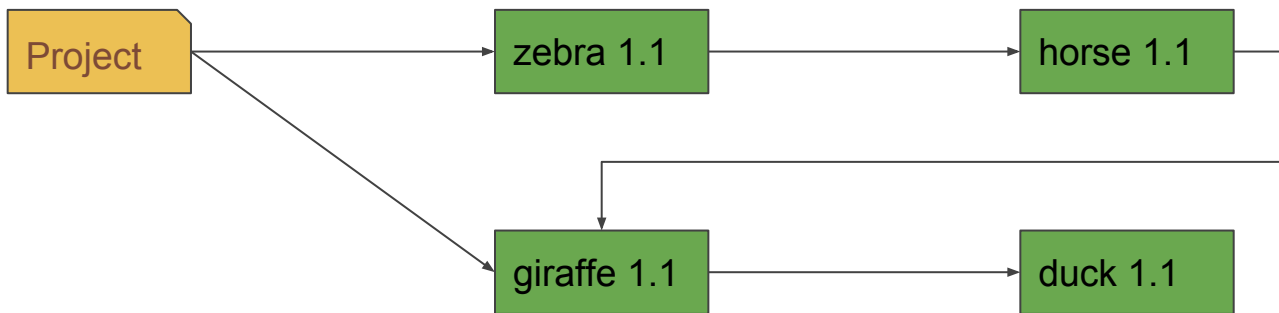
```
Updating zebra/zebra (1.0 -> 1.1)
```

# Partial Updates



```
$ composer update zebra/zebra --with-dependencies  
Updating horse/horse (1.0 -> 1.1)  
Updating zebra/zebra (1.0 -> 1.1)
```

# Partial Updates



```
$ composer update zebra/zebra --with-all-dependencies
```

```
Updating duck/duck (1.0 -> 1.1)
```

```
Updating giraffe/giraffe (1.0 -> 1.1)
```

```
Updating horse/horse (1.0 -> 1.1)
```

```
Updating zebra/zebra (1.0 -> 1.1)
```

# Best Practice: CI for Libraries

- Multiple runs
  - `composer install` from lock file
  - `composer update` for latest deps
  - `composer update --prefer-lowest --prefer-stable` for oldest (stable) deps
- Potentially multiple composer.json files with different platform configurations
  - `COMPOSER=composer-customer1.json php composer.phar update`
  - `COMPOSER=composer-customer1.json php composer.phar install`
  - Don't use this except for testing - you'll ruin our wonderful world where every PHP library can be installed with a plain composer install

# Best Practice: Semantic Versioning

## Promise of Compatibility

**X.Y.Z**

- Must be used consistently
  - Dare to increment **X**!
- Only valuable if BC/Compatibility promise formalized
  - See <http://symfony.com/doc/current/contributing/code/bc.html>
  - Document in Changelog



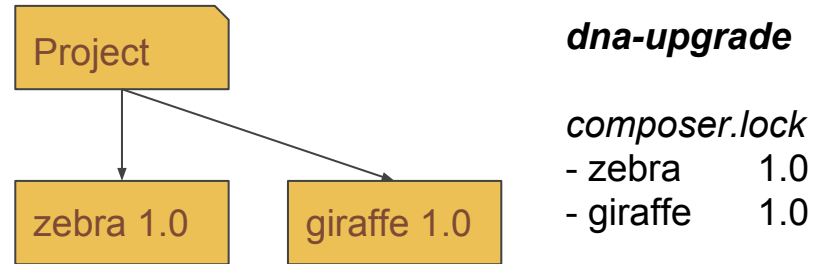
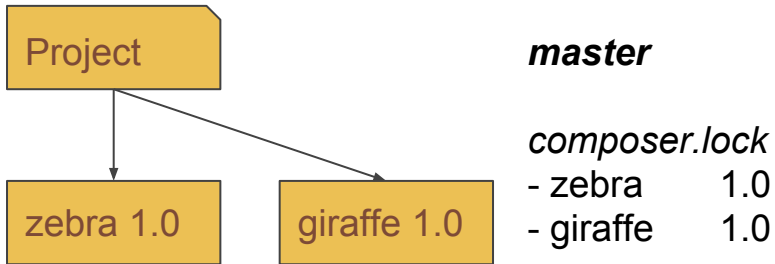
# Application/Project Versioning

- There are no other packages depending on yours?
  - **BC - for Composer consumption - doesn't matter**
- Options:
  - Don't use versions at all, rely on your VCS
  - Increment a single integer
  - Use semver if you ship the application

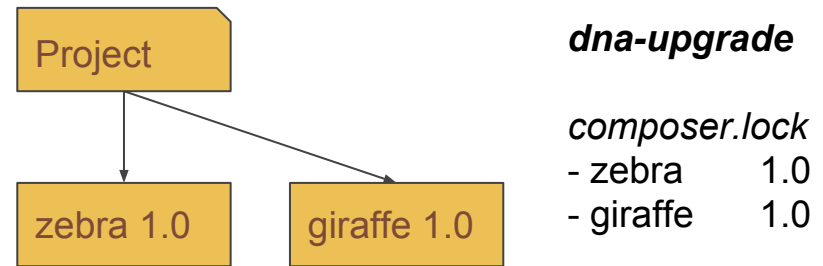
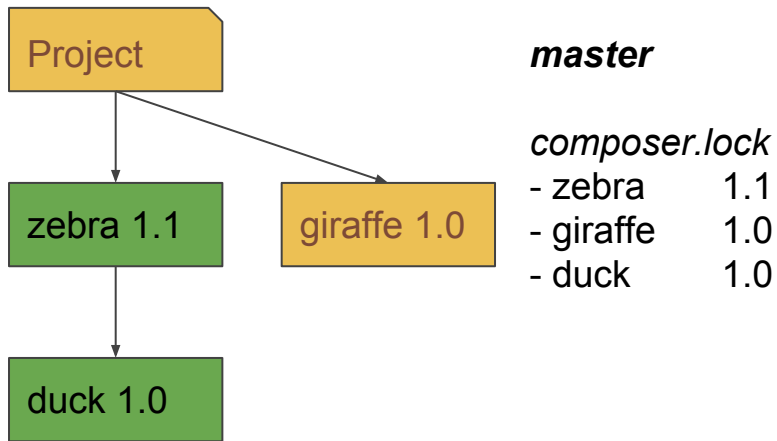


The Lock file will conflict

# Day 0: "Initial Commit"



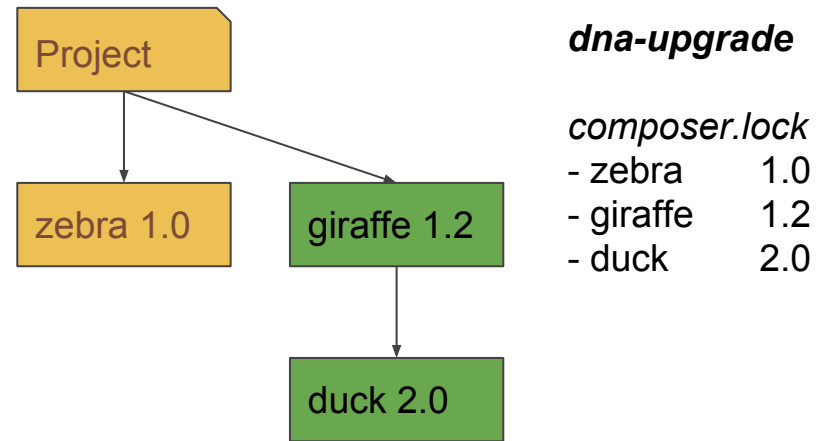
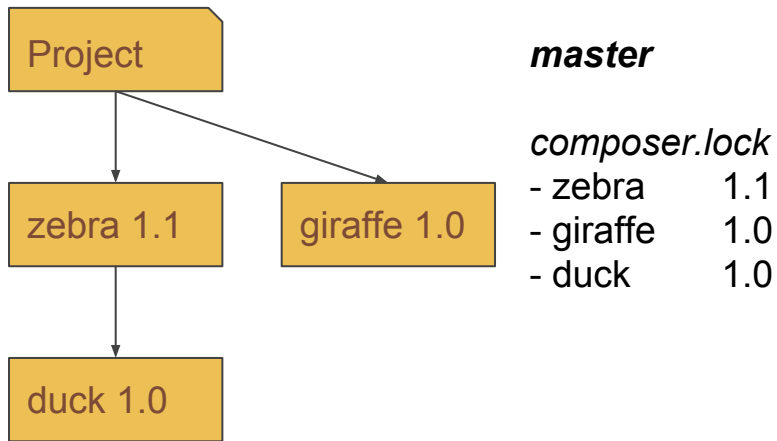
# Week 2: Strange new zebras require duck



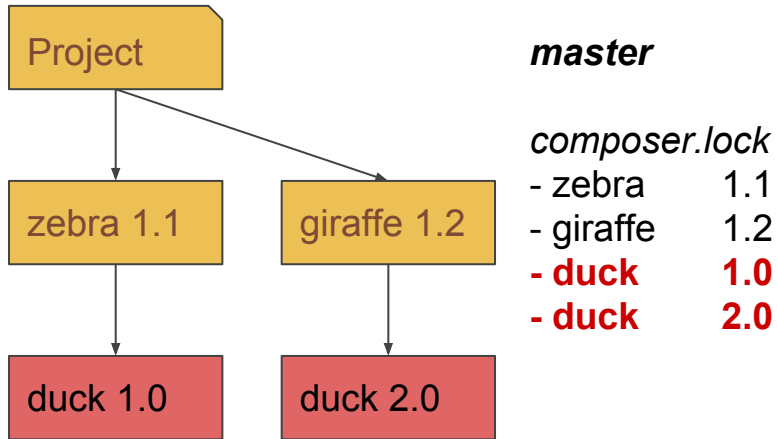


Week 3: Duck 2.0

# Week 4: Giraffe evolves to require duck 2.0



# Text-based Merge



**master**

*composer.lock*

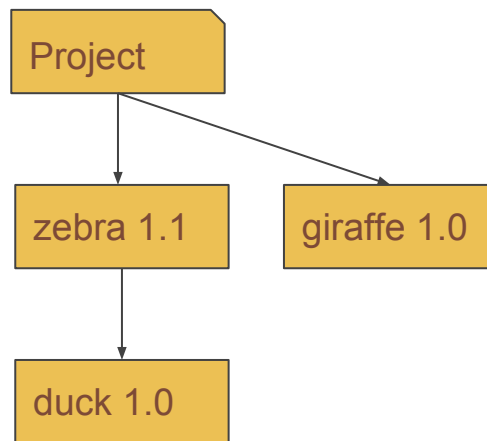
- zebra 1.1  
- giraffe 1.2  
**- duck 1.0**  
**- duck 2.0**

Merge results in invalid dependencies



# Reset composer.lock

```
git checkout <refspec> -- composer.lock  
git checkout master -- composer.lock
```



***dna-upgrade***

*composer.lock*

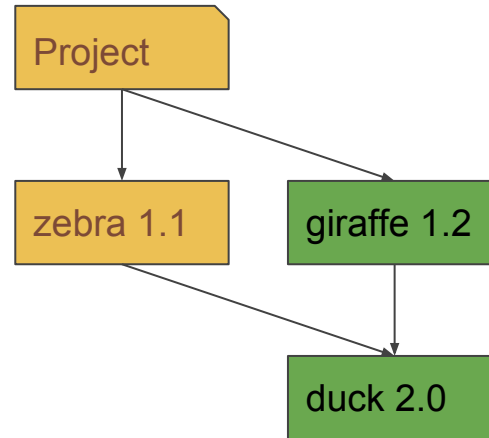
```
- zebra 1.1  
- giraffe 1.0  
- duck 1.0
```





# Apply the update again

```
composer update giraffe  
--with-dependencies
```



**master**

*composer.lock*

- zebra 1.1
- giraffe 1.2
- duck 2.0

# How to resolve lock merge conflicts?

- composer.lock cannot be merged without conflicts
  - contains hash over relevant composer.json values
- `git checkout <refspec> -- composer.lock`
  - `git checkout master -- composer.lock`
- Reapply changes
  - `composer update <list of deps>`

# New Features

**`--check-platform-reqs`**

Released in 1.6.0, Jan 2018

# Platform Requirements

- Platform repository
  - implicitly defined additional package repository
  - contains packages for
    - PHP
    - extensions
    - system libraries (e.g. libxml)
  - packages cannot be updated/installed/removed

# Platform Requirements

```
$ ./composer.phar show --platform
```

```
composer-plugin-api 1.1.0    The Composer Plugin API
ext-apcu             5.1.8    The apcu PHP extension
ext-ctype           7.2.5    The ctype PHP extension
ext-curl            7.2.5    The curl PHP extension
ext-date            7.2.5    The date PHP extension
ext-dom             20031129 The dom PHP extension
ext-fileinfo        1.0.5    The fileinfo PHP extension
ext-filter          7.2.5    The filter PHP extension
ext-ftp            7.2.5    The ftp PHP extension
ext-hash            1.0      The hash PHP extension
ext-iconv           7.2.5    The iconv PHP extension
ext-intl            1.1.0    The intl PHP extension
ext-json            1.6.0    The json PHP extension
ext-libxml          7.2.5    The libxml PHP extension
...
lib-curl            7.59.0   The curl PHP library
lib-ICU             58.2     The intl PHP library
lib-libxml          2.9.5    The libxml PHP library
lib-openssl         2.5.5    LibreSSL 2.5.5
lib-pcre            8.41     The pcre PHP library
php                 7.2.5    The PHP interpreter
php-64bit           7.2.5    The PHP interpreter, 64bit
php-ipv6            7.2.5    The PHP interpreter, with IPv6 support
```

# Platform Requirements

```
{  
  "require": {  
    "php": "^7.1.1"  
  }  
}
```

```
$ php -v  
PHP 5.6.10
```

```
$ composer update
```

Your requirements could not be resolved to an installable set of packages.

Problem 1

- This package requires php ^7.1.1 but your PHP version (5.6.10) does not satisfy that requirement.

# Platform Requirements

- What if you maintain multiple projects on your local system to be deployed to different platforms?
  - e.g. Server A running PHP 7.0, Server B running PHP 7.2
- What if you want to build Composer automation tools
  - Private Packagist at [packagist.com](https://packagist.com) runs on a single PHP version, managed projects have lots of different requirements

# Platform Requirements

```
{  
    "require": {  
        "php": "^7.1.1"  
    }  
}
```

\$ php -v  
PHP 5.6.10

\$ composer update --ignore-platform-reqs

No idea if dependencies even work on PHP 7.1.1



# Platform Requirements

```
“require”: {  
    “php”: “^7.1.1”,  
    “ext-intl”: “*”  
}  
“config”: {“platform”:{  
    “php”: “7.1.2”,  
    “ext-intl”: “1.1.0”  
}}  
}}
```

```
$ php -v  
PHP 5.6.10
```

```
$ composer update  
Success
```

# Platform Requirements

- Watch out if you are using Plugins!
  - Composer plugins (Composer installers are plugins, too)
    - Packages with type “composer-plugin”
    - Will be installed before all other packages if dependencies allow it
    - Code will be executed in Composer process during update/install
  - Can be disabled with **--no-plugins**
  - no easy way to run them on prod later
- Watch out if you are using scripts
  - Use **--no-scripts**
  - Run them separately in production with **composer run-script <name>**

# Platform Requirements

```
“require”: {  
    “php”: “^7.1.1”,  
    “ext-intl”: “*”  
}  
“config”: {“platform”:{  
    “php”: “7.1.2”,  
    “ext-intl”: “1.1.0”  
}}  
}}
```

\$ composer update

Success

- Create ZIP
- deploy to prod

**PHP Fatal Error**

Prod was actually still on PHP 5.6

# Platform Requirements

```
"require": {  
    "php": "^7.1.1",  
    "ext-intl": "*" }  
"config": {"platform": {  
    "php": "7.1.2",  
    "ext-intl": "1.1.0"  
}}}
```

- dev\$ composer update
- Create ZIP
- upload to prod
- **composer check-platform-reqs**
  - no error? switch to new code

# Summary

- `composer show --platform`  
`{"config":{"platform":{"php":"7.2.5"}}}`  
`composer check-platform-reqs`  
Watch out for plugins & scripts!
- `composer install --prefer-dist`
- Create a build artifact and do as little work in prod as possible
- `composer dump-autoload --optimize`  
`--classmap-authoritative`
- Update your license identifiers to SPDX 3.0
- SemVer: Don't be afraid to increase the major version
- Library CI: `composer update`  
`--prefer-lowest --prefer-stable`
- `composer update <package>`  
`--with-all-dependencies`
- `git checkout <branch> -- composer.lock`  
&& repeat `composer update`



Thank you!

Questions / Feedback?  
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