Gain Control over your Dependencies with Private Packagist

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Private Packagist
https://packagist.com

What is Dependency Management?

- Assembly
- Dependency Change Management
- Risk Analysis & Reduction

May happen at build time or at runtime

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Dependency Assembly

- Installation of Libraries, Tools, etc.
  - composer install
  - apt-get install foo
  - Application of Configuration Management (Puppet, Chef, Ansible, Salt, …)
- Configuration for Connections to Services, external APIs
  - Authentication
  - Glue Code
- Connection to Services (usually at Runtime)

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Dependency Assembly

Past:

- Step-by-Step installation instructions
- Readmes, Delete and reinstall individual packages

Today:

- Description of a system state (e.g. composer.json, top.sls)
- Tools to move the system into the state (e.g. composer, salt)

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Dependency Change Management

- Dependency Change
  - Adding, Removing, Updating, Replacing of Libraries
  - Replacing APIs
  - composer update
- Dependency Change Management
  - Balance Risks, Consequences, Cost & Advantages
  - Architecture Decisions which enable “Change”
    - Example: Abstraction to replace concrete service

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A brief history of Composer

- Symfony & phpBB plugins
- Apr 2011 - First Commit
- Sep 2011 - Packagist.org
- Apr 2012 - First 1,000 Packages
- Apr 2013 - First 10,000 Packages
- Jun 2014 - Toran Proxy

July 2017: 147,000 Packages with 907,000 Versions

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- Dec 2016 - Private Packagist

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Composer Design Principles

- Separate independent tools and services
  - Avoid PEAR confusion and problems
- Build reusable code to allow for other tools and services to emerge
  - Check out https://github.com/composer

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composer update/install

- Load all package metadata
- Resolve dependencies to create transaction (install/remove/update)
- Create lock file
- Download or checkout files from locations in lock file

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Satis

- Static File Generator
- Big config file of all packages
- Archive creation for downloads possible
- No hooks to trigger updates
- Not suitable for building further tools or services on top of it

- Considerably cost to setup & maintain

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Private Packagist

- Your own Composer repository done right
  - SaaS or on-premises - https://packagist.com
- Easy setup
  - Integration with GitHub, Gitlab, Bitbucket
- Authentication
- Permission Management

- Foundation for future functionality to simplify dependency management

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Load package metadata?

- Composer Repositories
  - packagist.org
  - Satis
  - Private Packagist
- VCS repositories
- Package repositories

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Package Repository

```
"repositories": [
    {
        "type": "package",
        "package": {
            "name": "vendor/package",
            "version": "1.0.0",
            "dist": {
                "url": "http://example.org/package.zip",
                "type": "zip"
            },
            "source": {
                "url": "git://example.org/package.git",
                "type": "git",
                "reference": "tag name, branch name or commit hash"
            }
        }
    }
],
"require": {
    "vendor/package": "1.0.0"
}
```

VCS Repository

```
"repositories": [
    {
        "type": "vcs",
        "url": "git://example.org/MyRepo.git"
    }
]
```

- Information is inferred from composer.json files in tags & branches
- dist download URLs only for known hosts, e.g. github, bitbucket, gitlab

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Composer Repository

```
"repositories": [
    {
        "type": "composer",
        "url": "https://satis.example.org/"
    },
    {
        "type": "composer",
        "url": "https://repo.packagist.com/my-org"
    },
    {
        "packagist.org": false
    }
]
```


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Composer Repository: Satis

```
packages.json:
{
    packages: {
        “seld/private-test”: {
            “dev-master”: {
                name: "seld/PRivate-test",
                version: "dev-master",
                version_normalized: "9999999-dev",
                source: {
                    ....
                },
                dist: {
                    ....
                },
                require: {
                    php: ">=5.3.0",
                ...
        }
    }
}
```


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Composer Repository: packagist.org

```
packages.json:
{
    packages: [ ],
    notify: "/downloads/%package%",
    notify-batch: "/downloads/",
    providers-url: "/p/%package%$%hash%.json",
    search: "/search.json?q=%query%&type=%type%",
    provider-includes: {
        p/provider-2013$%hash%.json: {
            sha256: "eb67fda529996db6fac4647ff46cf41bb31065536e1164d0e75f911d160f6b9f"
        },
        ...
        p/provider-archived$%hash%.json: {
            sha256: "444a8f22af4bc0e2ac0c09eda1f5edc63158a16e9d754100d7f774b930a38ae6"
        },
        p/provider-latest$%hash%.json: {
            sha256: "b0e0065f1e36f061b9fd2bbb096e7986321421f9eedc3d5e68dc4780d7295c33"
        }
    }
}
```


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Composer Repository: Private Packagist

```
packages.json:
{
    packages: {
        “seld/private-test”: {
            “dev-master”: {
                name: "seld/PRivate-test",
        ...
    }
    providers-lazy-url: "/myorg/p/%package%.json",
    mirrors: [
        {
            dist-url:
"https://repo.packagist.com/packagist-nosync/dists/%package%/%version%/%reference%.%type%",
            preferred: true
        }
    ]
}
```


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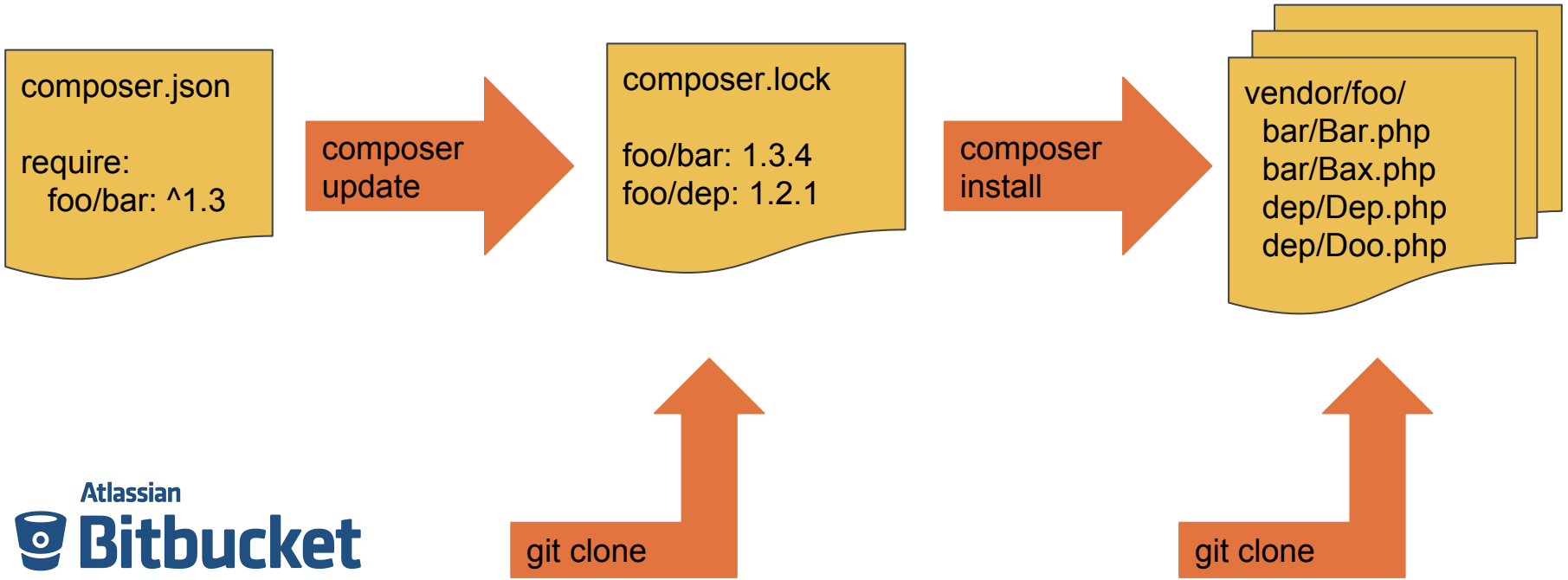
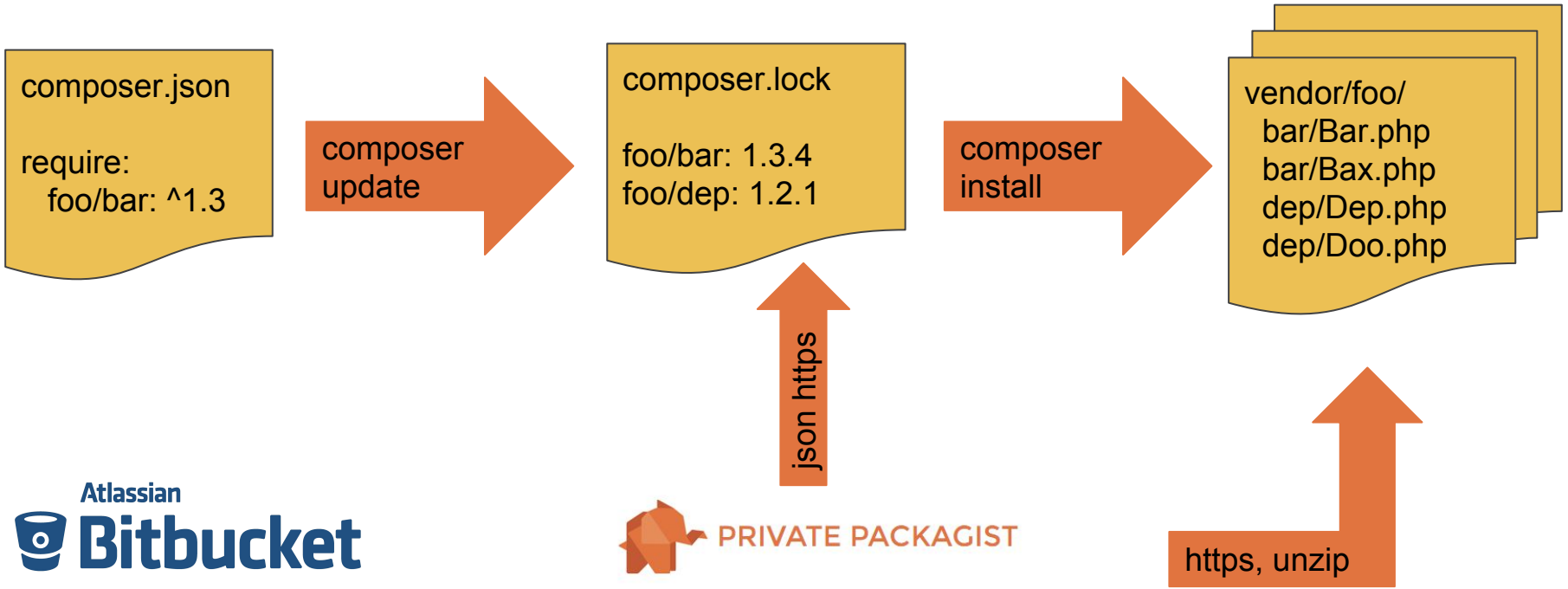
Composer with Private Dependencies



Composer with Private Dependencies: Private Packagist



Risk Analysis: Availability

Affects Assembly

Examples:

- Open Source Library deleted
- Payment Service unavailable
- EU VATId Service out of order
- Jenkins not accessible

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Risk Reduction: Availability

- Software is available when you have a copy
  - composer cache
  - Forks
  - Private Packagist or Satis

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Composer with Open Source Dependencies

composer.json

require:
foo/bar: ^1.3

composer update

composer.lock

foo/bar: 1.3.4
foo/dep: 1.2.1

composer install

vendor/foo/
bar/Bar.php
bar/Bax.php
dep/Dep.php
dep/Doo.php

packages.json

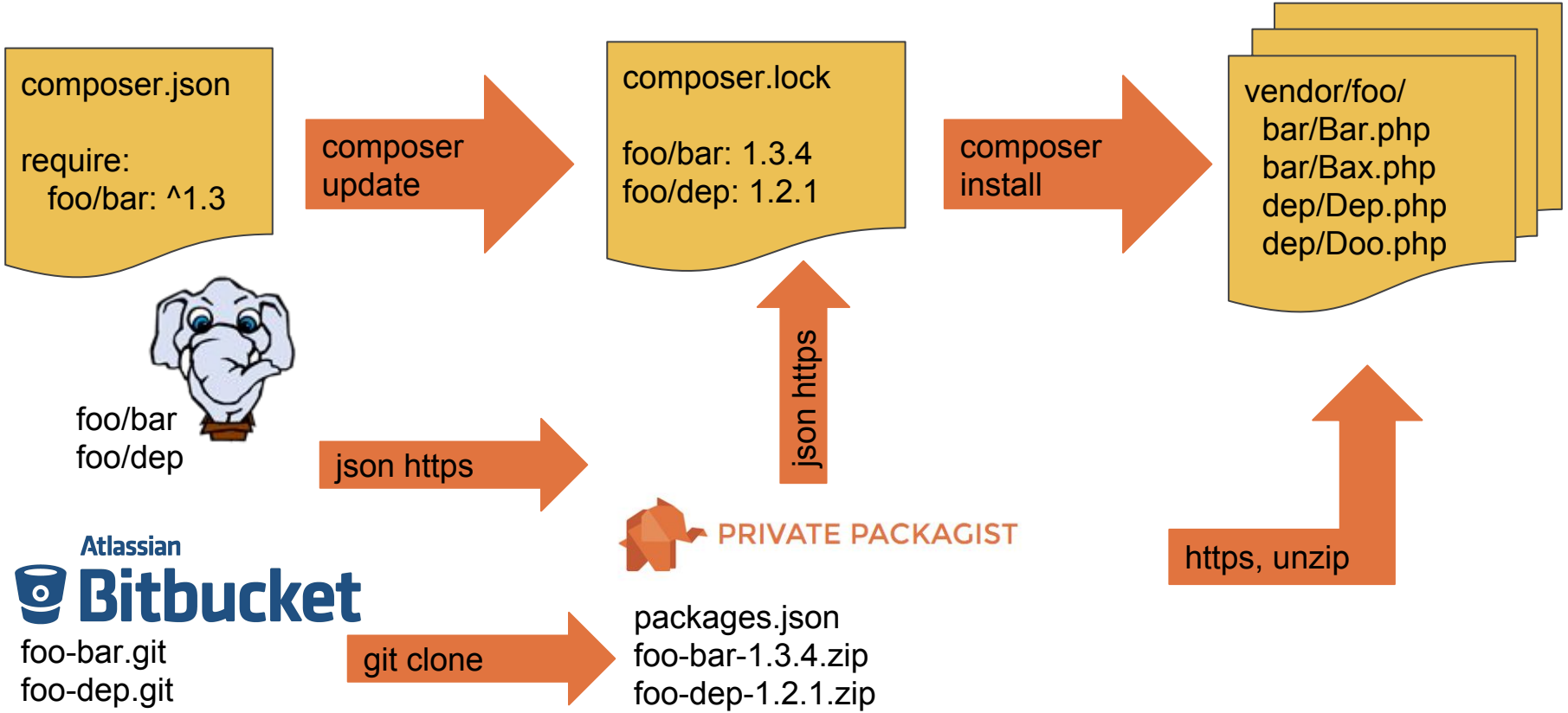
json https

Atlassian Bitbucket

foo-bar.git
foo-dep.git

git clone

Composer with Open Source Dependencies: Private Packagist



Downloading files from the lock file

```
{
    "content-hash": "bb557b05609c879265a30bc052ef77e4",
    "packages": [
        {
            "name": "aws/aws-sdk-php",
            "version": "3.25.6",
            "source": {
                "type": "git",
                "url": "https://github.com/aws/aws-sdk-php.git",
                "reference": "fe98140a4811abbe9104477b167dc3c7f9a8391b"
            },
            "dist": {
                "type": "zip",
                "url": "https://api.github.com/repos/aws/aws-sdk-php/zipball/fe...",
                "reference": "fe98140a4811abbe9104477b167dc3c7f9a8391b",
            },
            "require": {
                "guzzlehttp/guzzle": "^5.3.1|^6.2.1",
```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Downloading files from the lock file with Private Packagist

```
    "packages": [
        {
            "name": "aws/aws-sdk-php",
            "version": "3.25.6",
            "source": {
                "url": "https://github.com/aws/aws-sdk-php.git",
                ...
            },
            "dist": {
                "type": "zip",
                "url": "https://api.github.com/repos/aws/aws-sdk-php/zipball/...",
                "reference": "fe98140a4811abbe9104477b167dc3c7f9a8391b",
                "mirrors": [
                    {
                        "url":
"https://repo.packagist.com/phpbb/dists/%package%/%version%/%reference%.%type%",
                        "preferred": true
                    }
                ]
            }
```

Risk Reduction: (New) Dependencies

Quality Criteria for software libraries (and services)

- Number of Maintainers / Developers
- Actively Developed?
- How many users?
  - Packagist shows installation count
- Where is a library being installed from?
  - GitHub, self-hosted svn server? -> Availability
- Alternatives / how easy to replace? Complexity?
  - Could you take over maintenance?

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Risk Reduction: Compatibility

Semantic Versioning (Semver) promises Compatibility

x.y.z

- Must be used consistently
- Only valuable if BC/Compatibility promise formalized
  - See http://symfony.com/doc/current/contributing/code/bc.html
- Otherwise choose narrower Version Constraints, check more frequently
  - e.g. ~1.2.3 instead of ^1.2.3

Risk Reduction: Compatibility

- Automated
  - Tests
  - Static Analysis
- Manual
  - Read Changelogs (and write them!)
  - Experience which libraries break BC

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Risk Minimization: Compliance / Legal

- Affects Change Management
- Example
  - Viral Copy-Left License not compatible with proprietary product

- `composer licenses`
- Private Packagist License Review

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Assessing & Managing Risk

- Formulate a Plan B
- Identify problems which are probable and which have great effects

- **Dependencies are great!** They can save tons of money and time
- Only spend resources on reducing risk until the risk is acceptable

- Private Packagist can help you manage and reduce these risks by being the one central place for all your third party code

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How is Private Packagist helping?

- Faster and more reliable composer operations
- Work with private dependencies more efficiently
  - Automatic synchronization of packages, teams, users, permissions
  - Authentication Tokens
- One central place for all your dependencies

  Improved understanding of and control over open-source usage
  - Statistics and references between internal code and open-source code
  - License review
- Much more to come!

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Thank you!

https://packagist.com

10% off first 12 months with code t3dd17

Questions / Feedback?

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