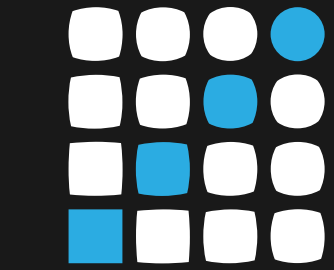

APACHE SLING & FRIENDS TECH MEETUP

2-4 SEPTEMBER 2019

From monolith to modules

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Welcome

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About us

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Software Engineer

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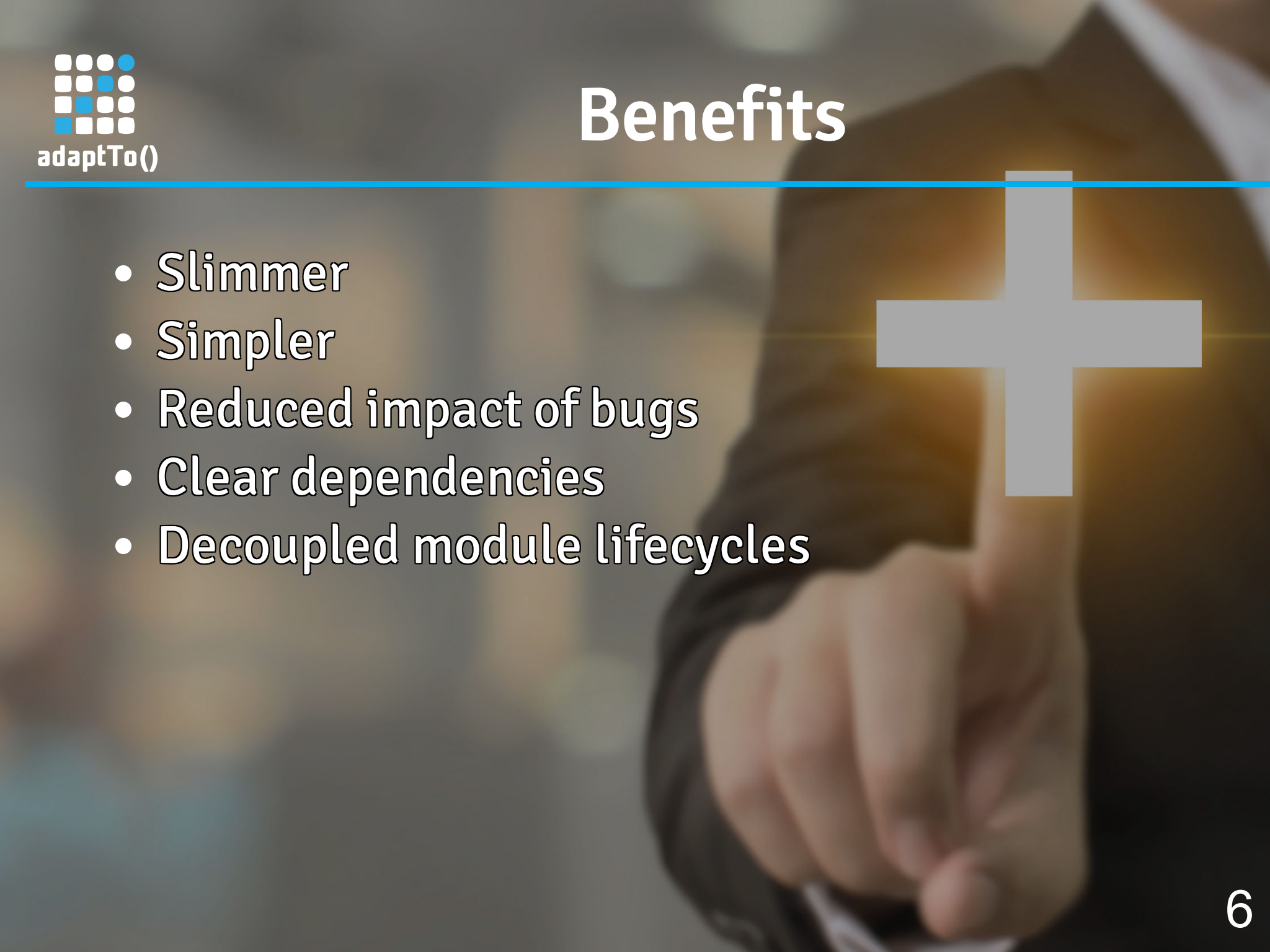
Senior Computer Scientist

Outline

- Benefits vs cost of modularization
- Decoupling patterns
- Tooling support
- Keeping QA effort under control

Modularisation



Benefits

- Slimmer
- Simpler
- Reduced impact of bugs
- Clear dependencies
- Decoupled module lifecycles

Costs

- Complexity of API Governance
- Planning & Testing for absence of modules
- Complexity & Fragmentation of deployment & maintenance procedures
- Additional aspect to development flow & tooling

We need a plan...

- Global API to modularized API
- Extend & integrate tooling
- Start cutting

Decoupling patterns - OSGi

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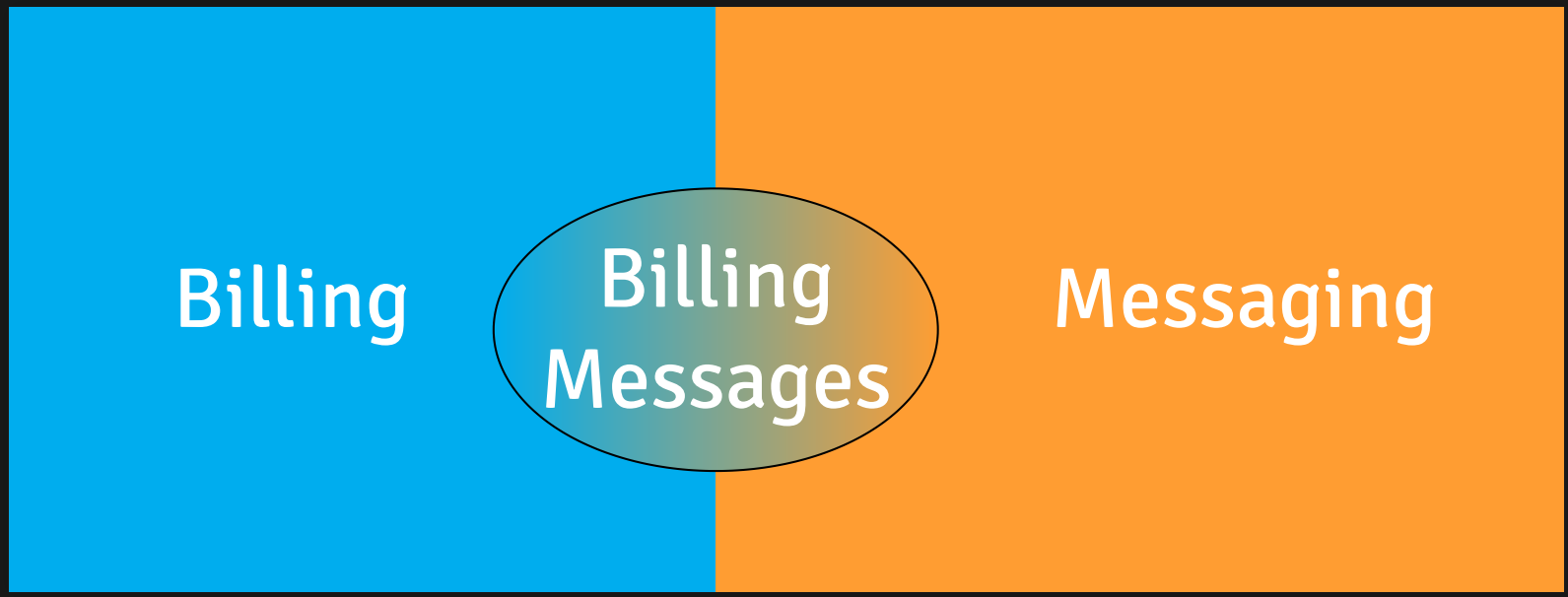
Glue bundles



Glue bundles

- ⊞ Encapsulates the dependencies
- ⊟ Refactoring to a glue bundle can be difficult
- ⊟ Glue bundles need to be explicitly deployed when needed

Optional dependencies

```
<Import-Package>
    com.example.billing.api;resolution:=optional
    ,*
<Import-Package>
```

Optional dependencies

```
@Component(enabled=false)
public class MyComponent { /* ... */ }

@Component
public class MyComponentStarter {
    protected void activate(ComponentContext ctx) {
        try {
            log.info("Found class {}", BarImpl.class);
            ctx.enableComponent(MyComponent.class.getName());
        } catch ( Throwable t)  {
            log.info("Foo component unavailable due to
                missing Bar module", t);
        }
    }
}
```

Optional dependencies

- ⊞ Minimal impact on existing code bases
- ⊟ Unnatural pattern to prevent ERROR log entries
- ⊟ Indicator of low cohesion

Overlays

```
public interface Foo { }

@Component
public class MyConsumer {
    @Reference(policyOption = ReferencePolicyOption.GREEDY)
    private Foo foo;
}

@Component // default service.ranking of 0
public class DefaultFooImpl implements Foo { }

@Component(property = {
    Constants.SERVICE_RANKING +":Integer=100"
})
public class MyBetterFooImpl implements Foo { }
```

Overlays

- ⊞ Simple and well-understood mechanism of overriding service references
- ⊟ Requires consumers to mark references as greedy
- ⊟ Service ranking are complicated to manage for large numbers of implementations

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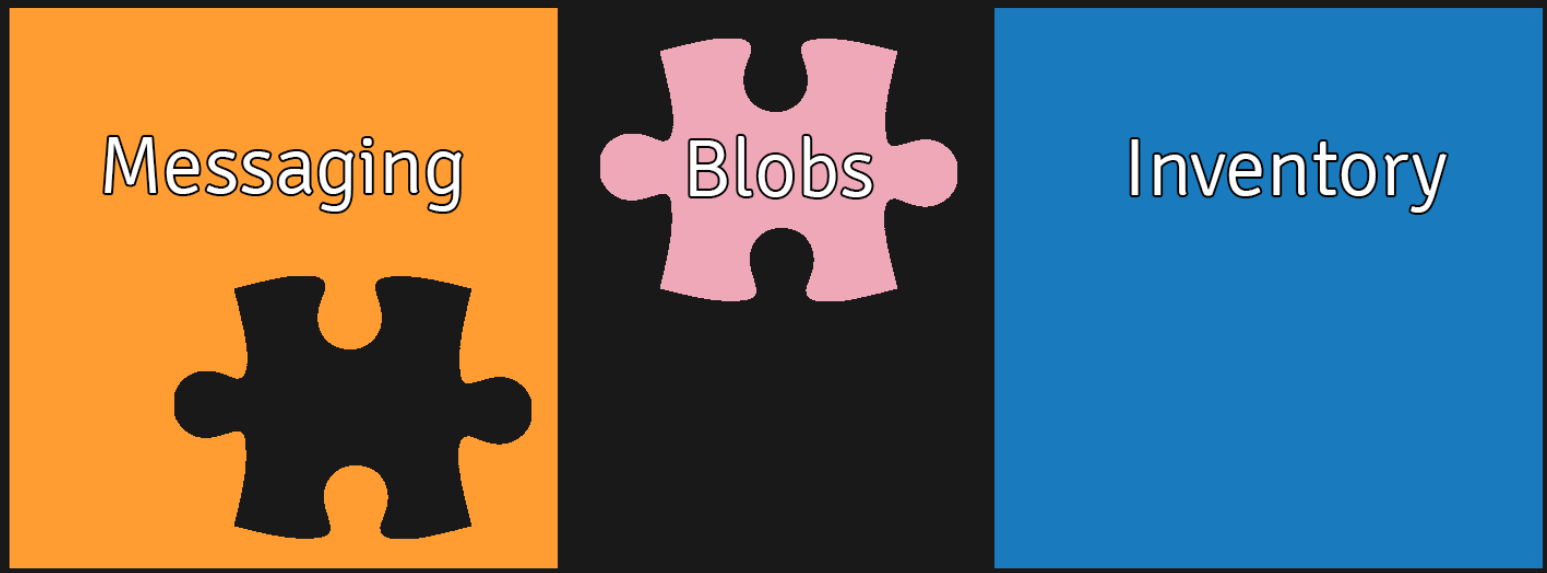
Feature extraction



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Feature extraction

- ⊞ Usually cleans up incorrect layering
- ⊟ Dependencies can spiral out of control

Decoupling patterns - content

Glue components

```
private static final RenderCondition INSTANCE =
                    new RenderCondition() {
   @Override
   public boolean check() {
     try {
       new Handlebars();
       return true;
     } catch (NoClassDefFoundError e) {
       return false;
     }
   }
 };
```

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Glue components

- ⊞ Minimal impact on existing code bases
- ⊞ Established AEM pattern
- ⊟ Pushes modularity at the class, instead of the bundle level

Overlays

```
<execute
    jcr:primaryType="nt:unstructured"
    sling:resourceType="some/workflow/step">
    <executor
        jcr:primaryType="nt:unstructured"
        className="com.adobe.foreign.module.ExecutorImpl"/>
</execute>
```

Overlays

- ⊞ Minimal impact on existing code bases
- ⊟ Can lead to surprising behaviour at runtime

Decoupling patterns - generic

Inlining

- Rule of three → write, duplicate, refactor
- Code duplication is a smell, not a crime
- Refactoring and abstractions are costly

Decoupling patterns - generic

Moving checks at build time

Build time » Test Time » Run Time

```
[ERROR] Bundle org.apache.sling.caconfig.spi:1.3.4 is importing
package(s) org.apache.sling.api.resource in start level 20 but
no bundle is exporting these for that start level.
```

Potential areas for extension

- Validate content-package Java imports are satisfied
- Generate constraints for discovered workflow steps

Modularised testing


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Modularised testing
Combinatorial nightmare
Optimize CI/CD pipeline to act on module level
ASSURANCE
30

Summary

Impact of AEM modularisation

- ⊞ Reduced API surface
- ⊞ Faster install and startup times
- ⊞ Lower memory usage
- ⊞ Reduced disk footprint
- ⊟ More complex development and testing scenarios