



DEVOPS WORLD

by CloudBees

Keeping Your Applications Secure w/ Cloud Native Buildpacks

Javier Romero

Sr. Software Engineer, VMware

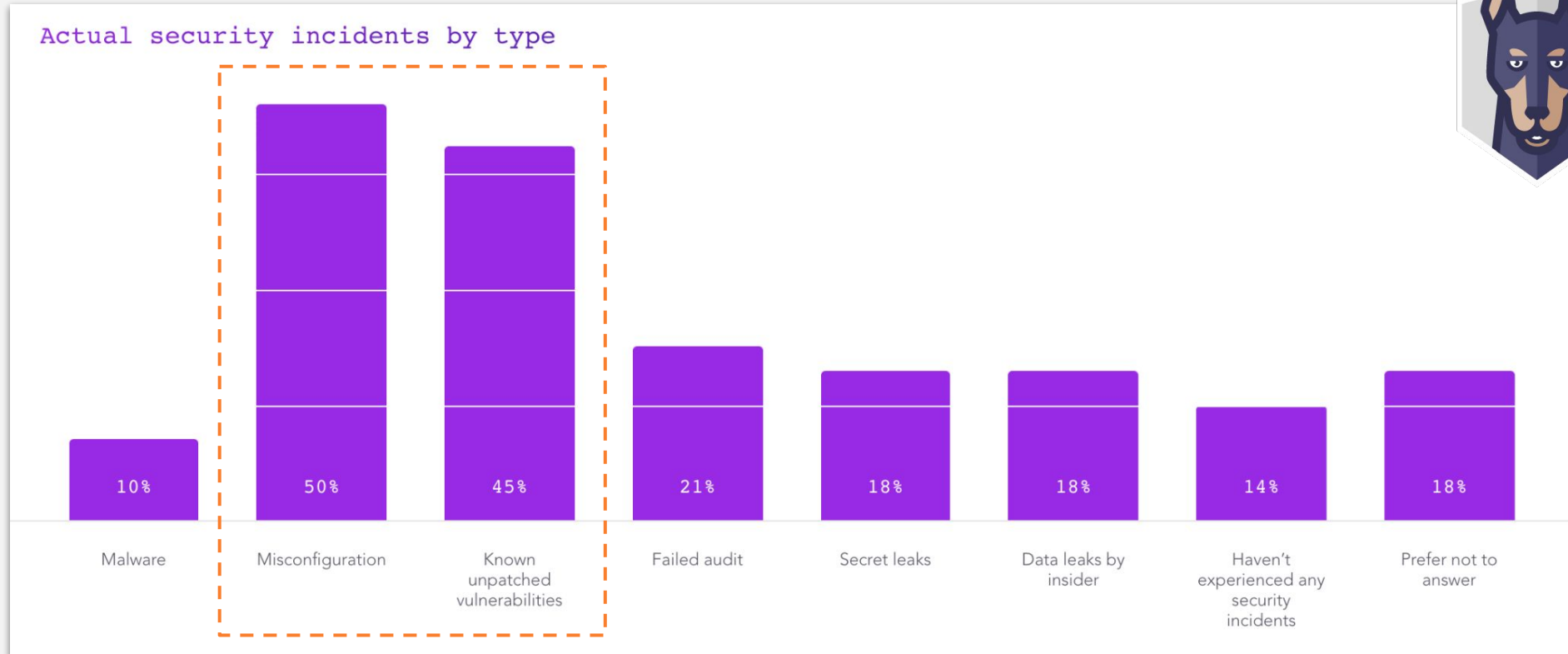
Twitter - [@JavierRom](https://twitter.com/JavierRomero)

Sambhav Kothari

ML Infrastructure Engineer, Bloomberg

Twitter - [@_sambhavkothari](https://twitter.com/_sambhavkothari)

State of Security

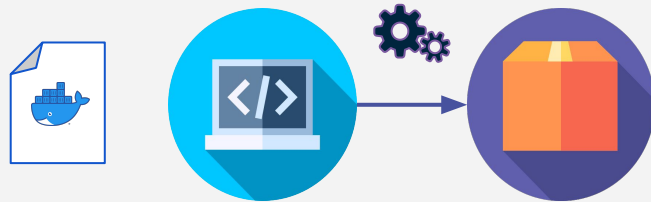




Security

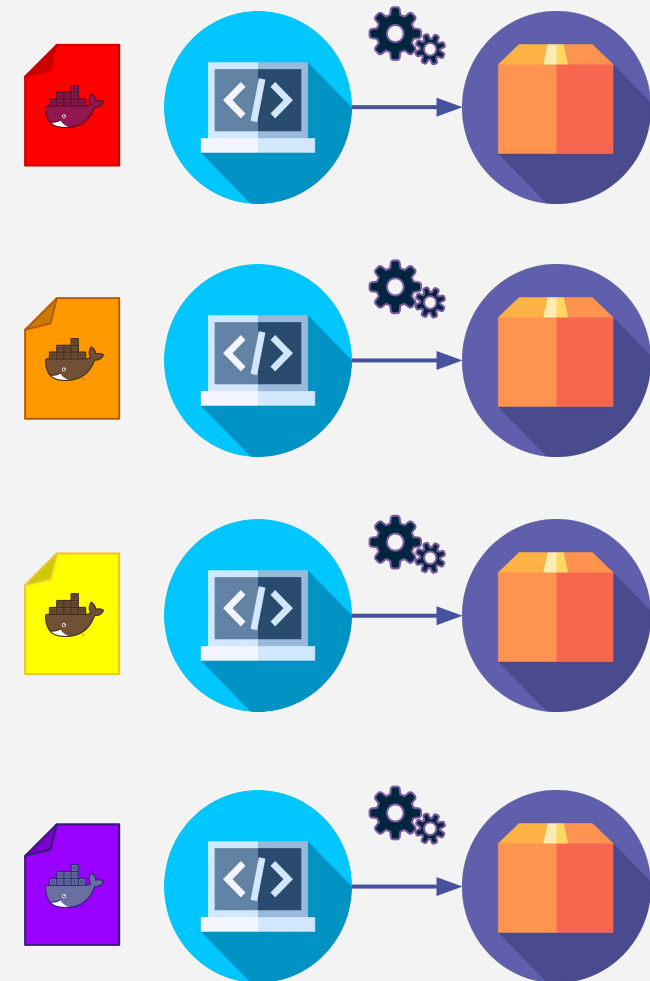
Misconfiguration

Dockerfiles



Pain Points:

- Dockerfile best practices
 - Multistage builds
 - Minimize number of layers
 - Leverage build cache
 - ...
- App specific best practices
 - Use JDK during build, JRE during run
 - Cache node_modules
 - Memory allocation
 - ...
- Not easy to reuse / compose logic into multiple applications

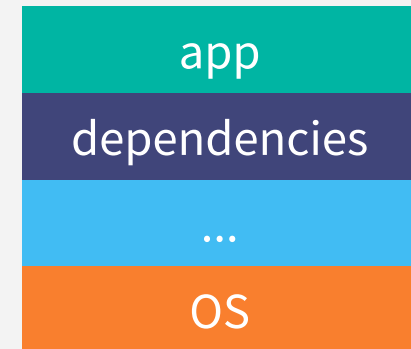
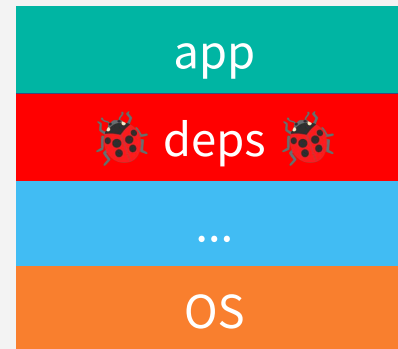
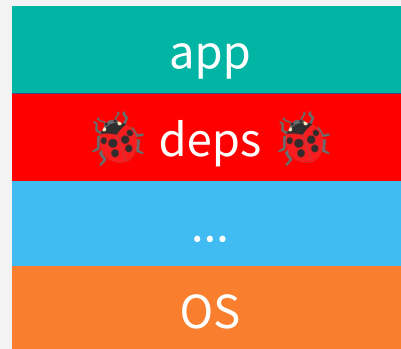
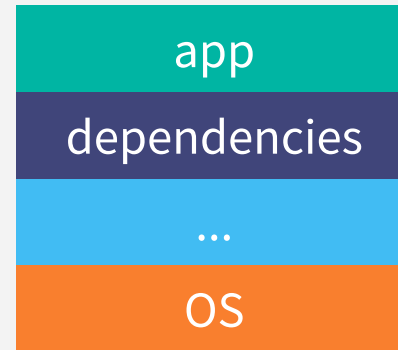
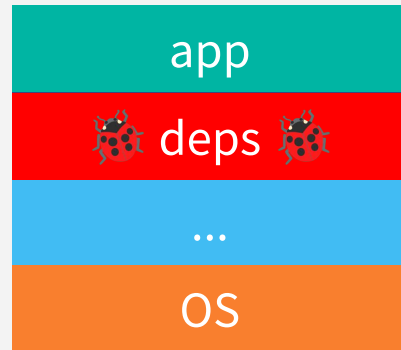
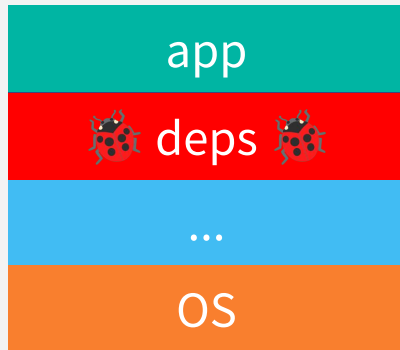




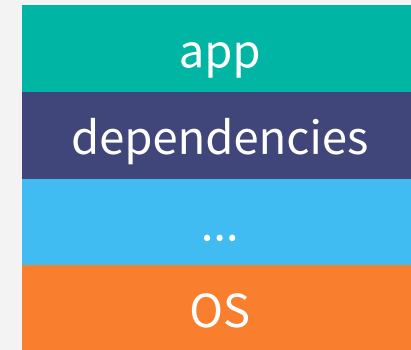
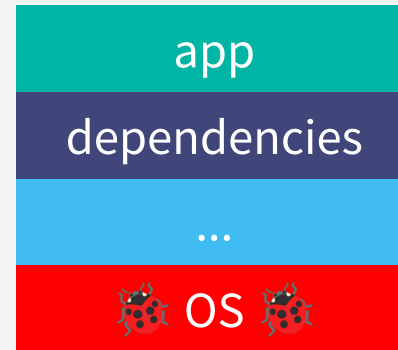
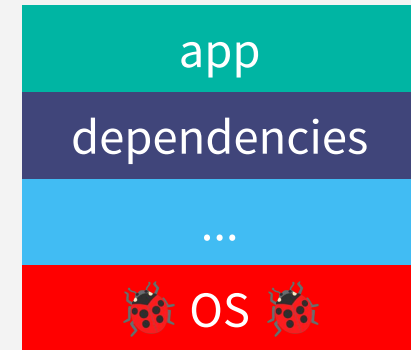
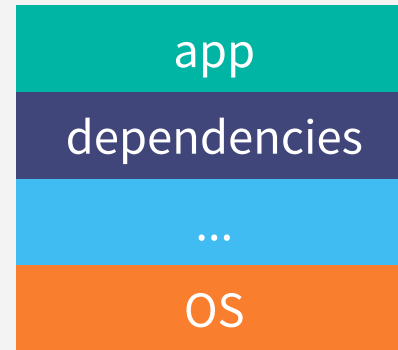
Security

Known Vulnerabilities

App Dependency Vulnerabilities

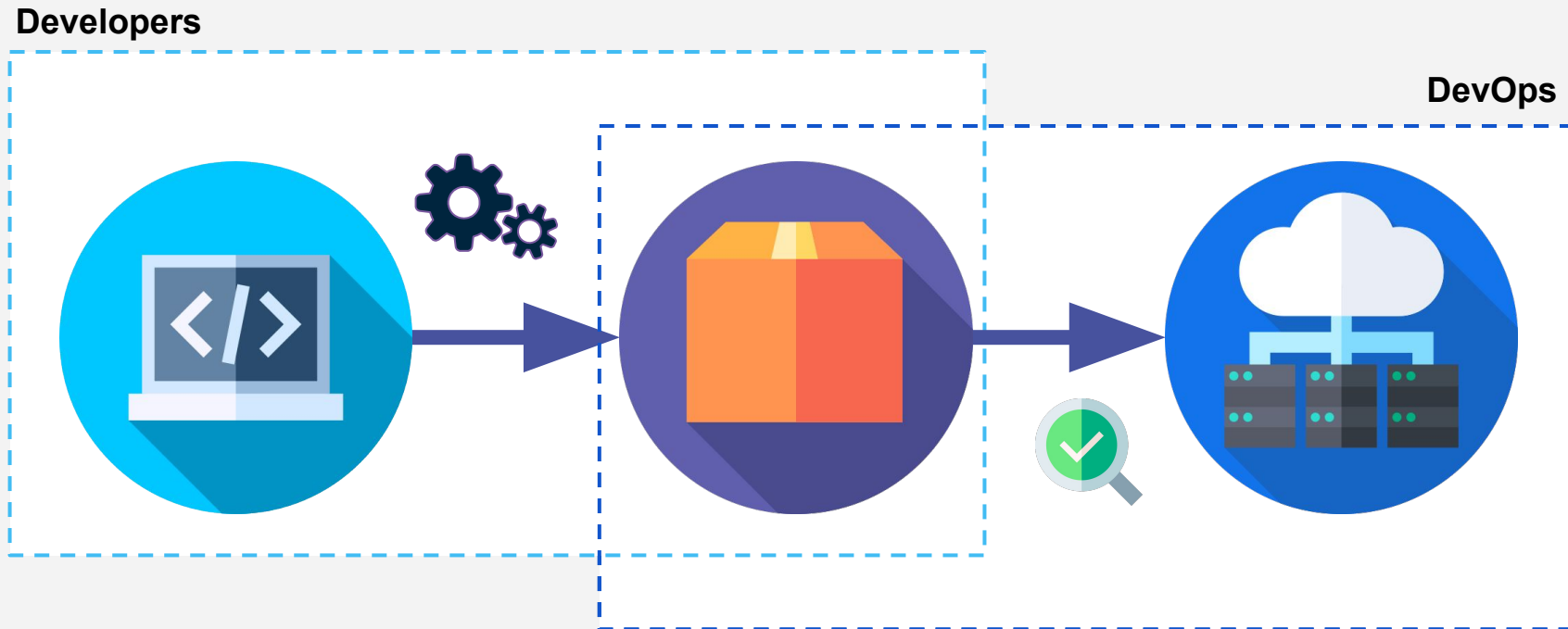


OS Vulnerabilities



Workflow

without Cloud Native Buildpacks



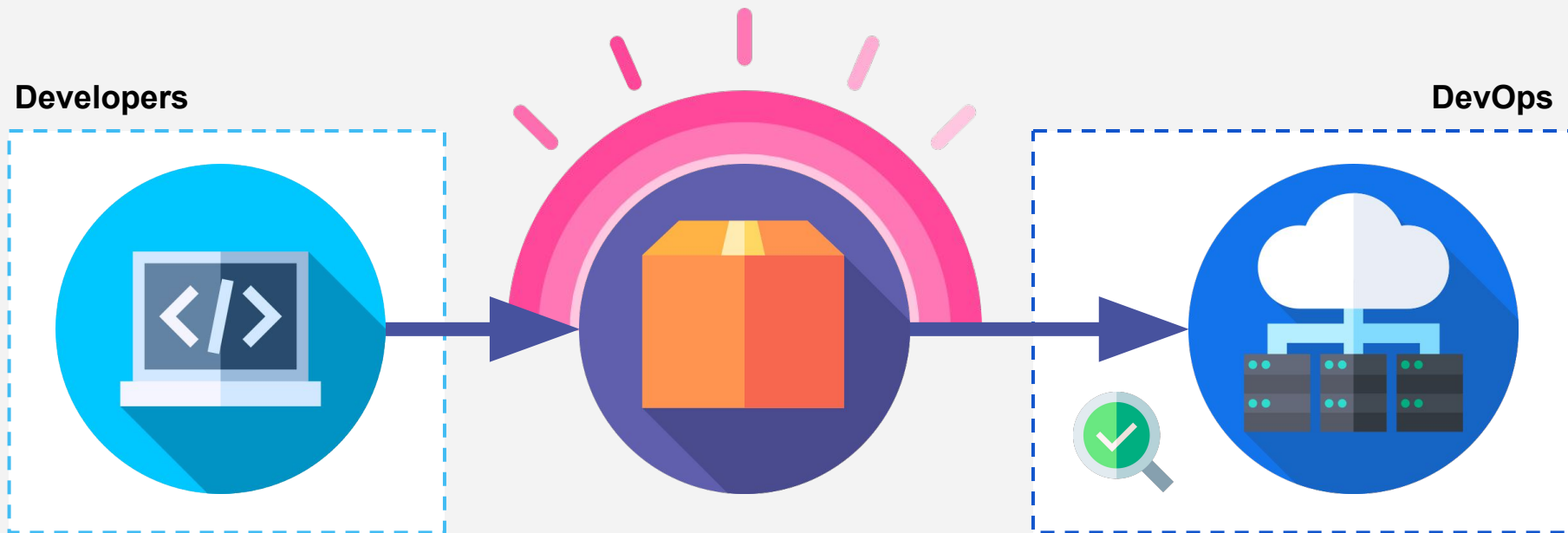


A better way...

Cloud Native Buildpacks

Workflow

with Cloud Native Buildpacks



Provides:

- **App Developer:**
Build app to image with little to no configuration
- **DevOps:**
Update dependencies without source changes
OS layer updates without developer intervention

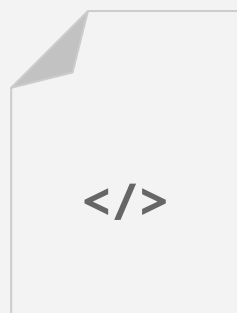


Security

Misconfiguration

Buildpacks

What are they?



source

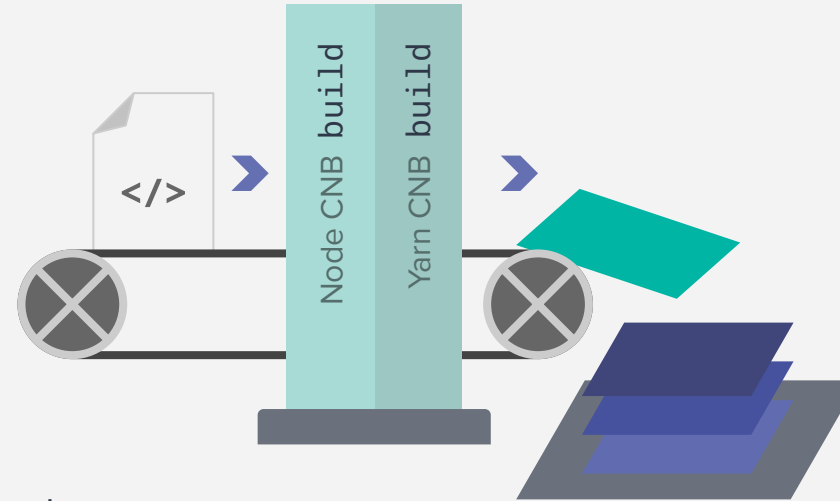
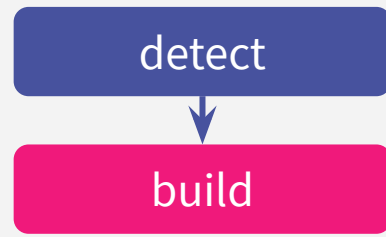


without Dockerfiles



OCI image

Buildpacks



- Run each buildpack's **detect** binary against the source code
- For the first buildpack group that passes detection, executes each buildpack's **build** binary, in order
- **build** gathers dependencies, compiles the app (if needed), and sets launch command

Buildpacks

Who provides the buildpacks?



AND/OR



Misconfigurations

Gone!

Using **Cloud Native Buildpacks**,
developers can leverage the best
practices for image creation of
industry leaders, communities,
and their **peers**.



Security

Known Vulnerabilities

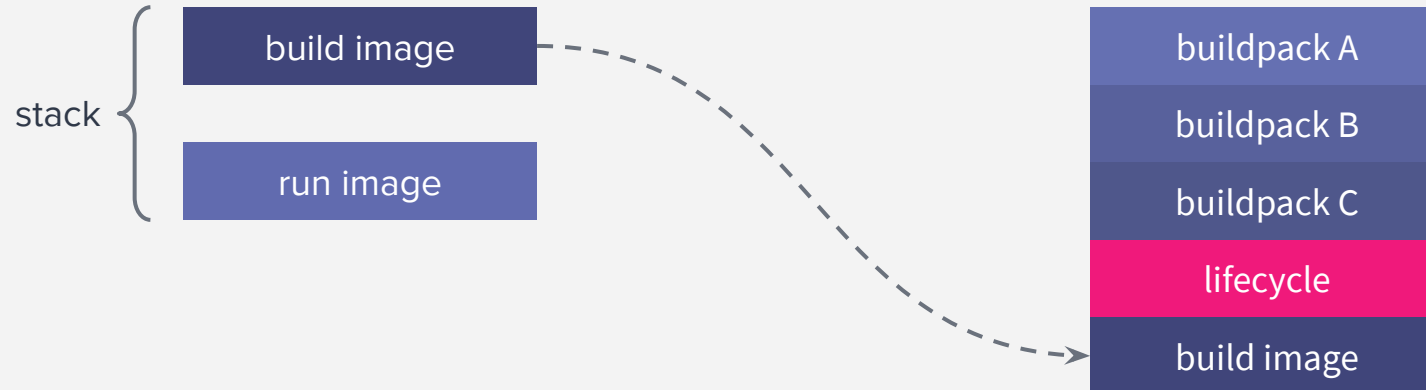
Stacks and Builders

Stack: two OS images that provide...

- Build-time environment
- Run-time environment

Builder: complete context for building

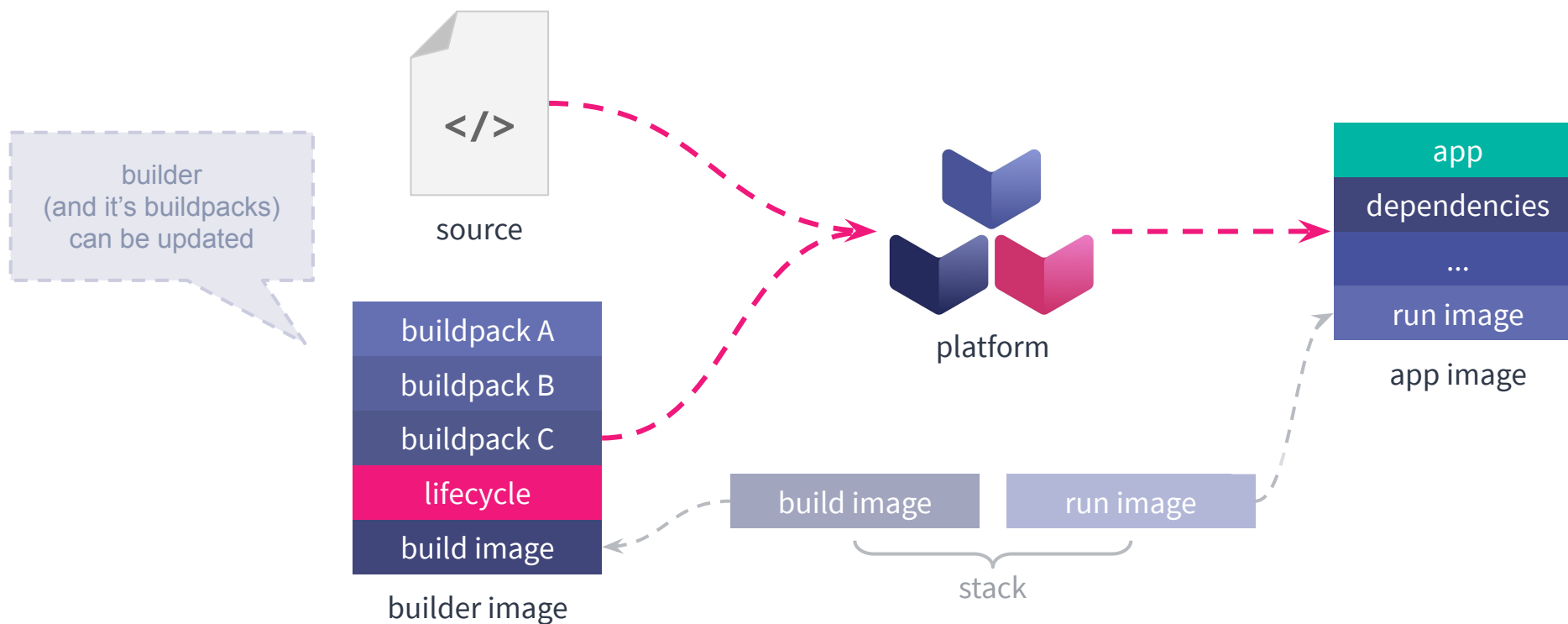
- Contains buildpack binaries
- Contains lifecycle binaries
- Image based on build image from stack



(Re-)Build

App Dependency Patches

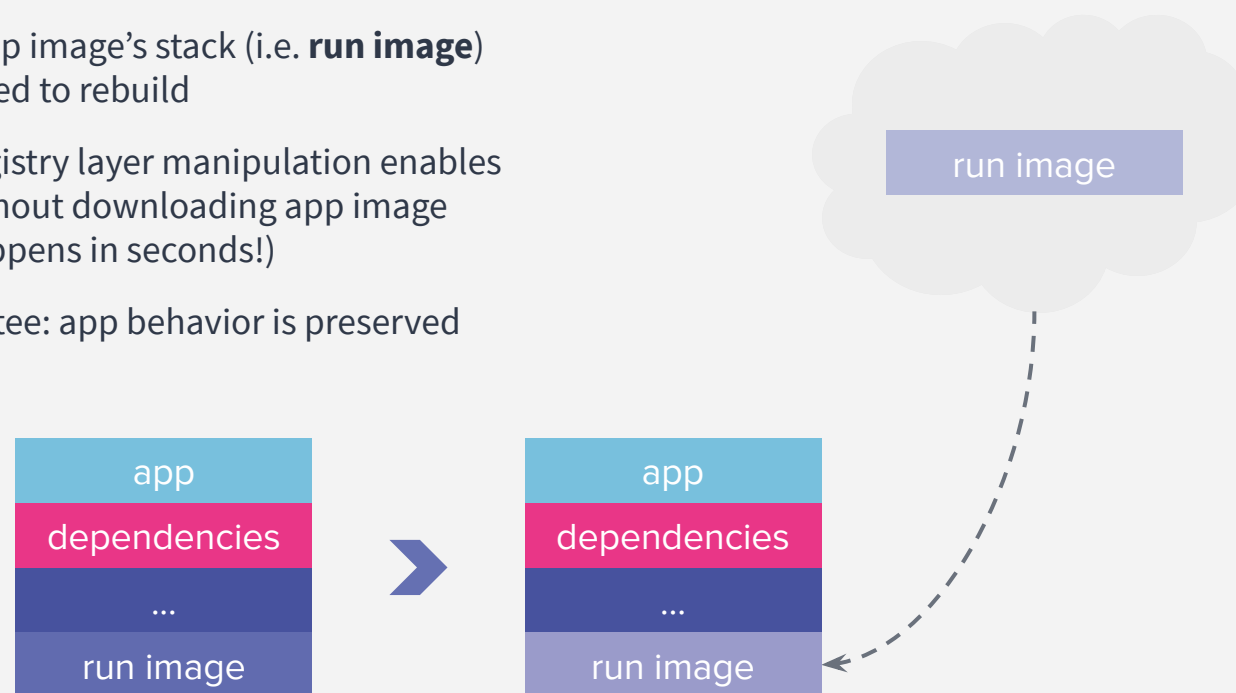
- Gather the source code and builder
- Execute the **lifecycle** in container



Rebase

OS Dependency Patches

- Updates app image's stack (i.e. **run image**) without need to rebuild
- Remote registry layer manipulation enables update without downloading app image (rebase happens in seconds!)
- ABI guarantee: app behavior is preserved



~~Known Vulnerabilities~~

Patched!

*Using **Cloud Native Buildpacks**,
applications can be **patched** with
little to no developer intervention.*

Other features

Reproducibility

Reproduces the same app image digest when re-running the build.

Minimal App Image

Image contains only what is necessary reducing attack surface.

Bill-of-Materials

Insights on the contents of the app image to set proper policies.

Learn more at buildpacks.io/features

Get Started



- CLI
- Build and rebase locally:
`pack build ...`
`pack rebase ...`
- Additional utilities:
`pack builder create ...`
`pack buildpack package ...`
...



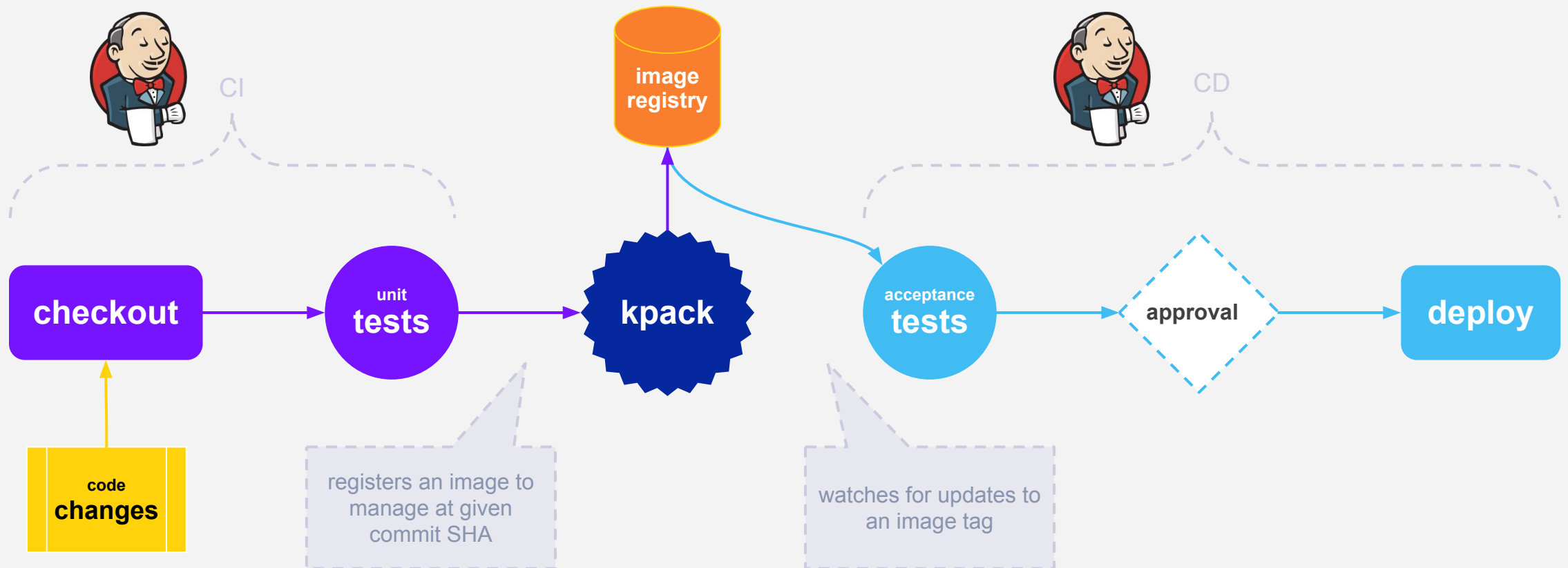
- Kubernetes build service
- Declarative types to build app images
- Schedules image rebuilds based on buildpack and source changes



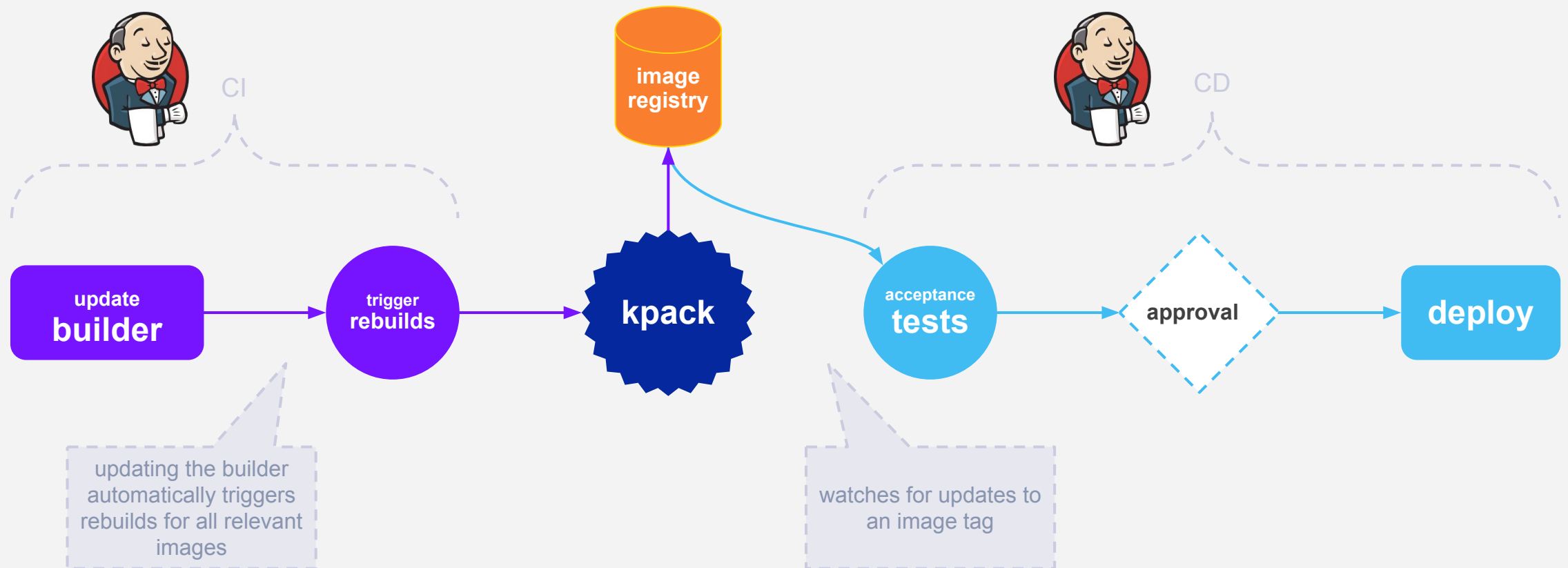
Demo...

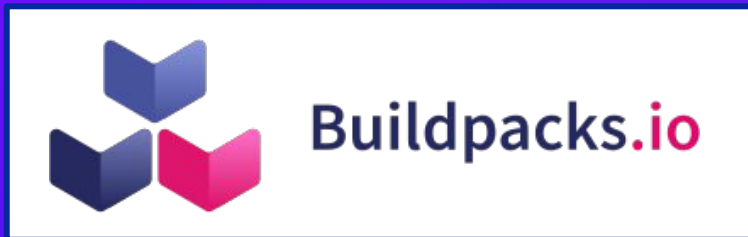
Using them with Jenkins

Developer Workflow



DevOps Workflow





Slack

slack.buildpacks.io

GitHub

github.com/buildpacks
github.com/pivotal/kpack

Twitter

[@buildpacks_io](https://twitter.com/buildpacks_io)

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COMMUNITY

Section Header Layout

Arial 40pt

Section Header Subtitle Arial 28pt



COMMUNITY

Section Header Layout

Arial 40pt

Section Header Subtitle Arial 28pt

Title and Content Layout: Arial 32pt

- First level bullet text, Arial 24pt
- Line spacing 0.95, before paragraph 12pt
- Left justified
- Sentence case
- First level bullet color is accent 1
 - Second level bullet Arial 18pt
 - Line spacing 0.95, before paragraph 6pt

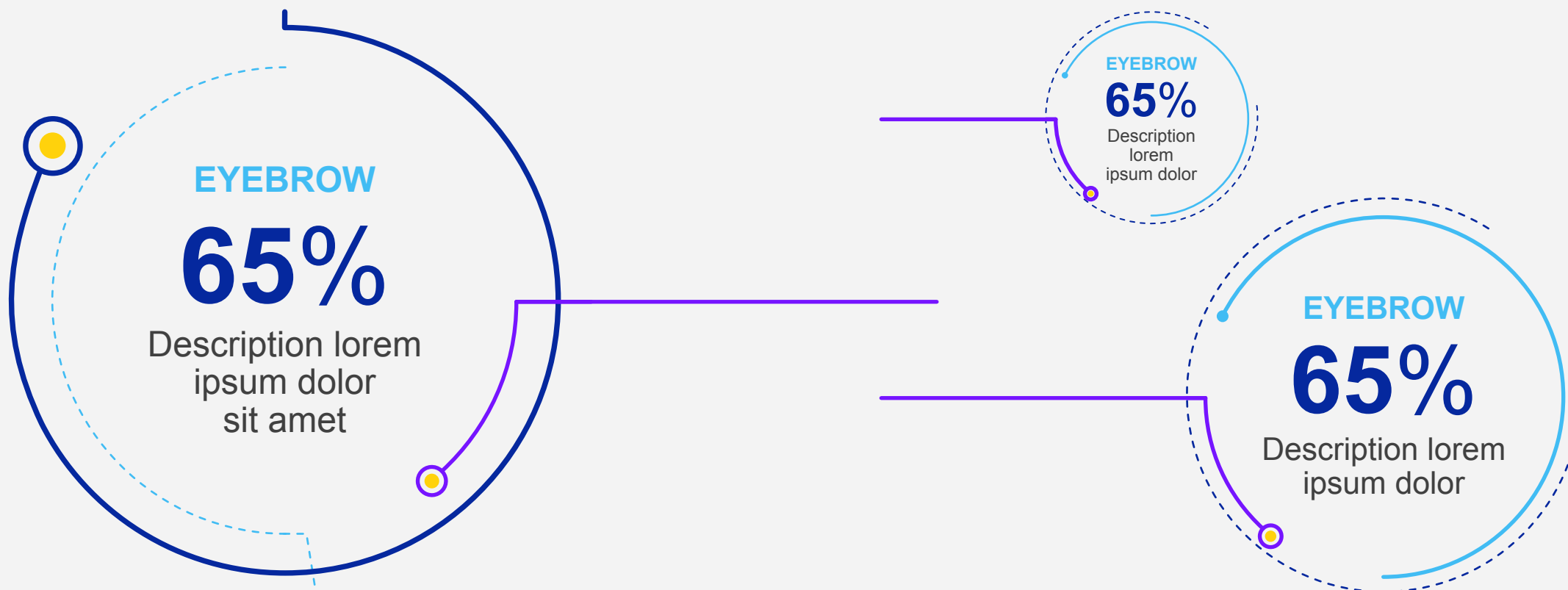
Two Content Layout

- First level bullet, Arial 24pt
- Line spacing 0.95, before paragraph 12pt
- Left justified
- Sentence case
- First level bullet color is accent 1
 - Second level Arial 18pt
 - Line spacing 0.95, before paragraph 6pt

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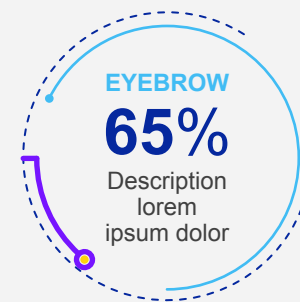
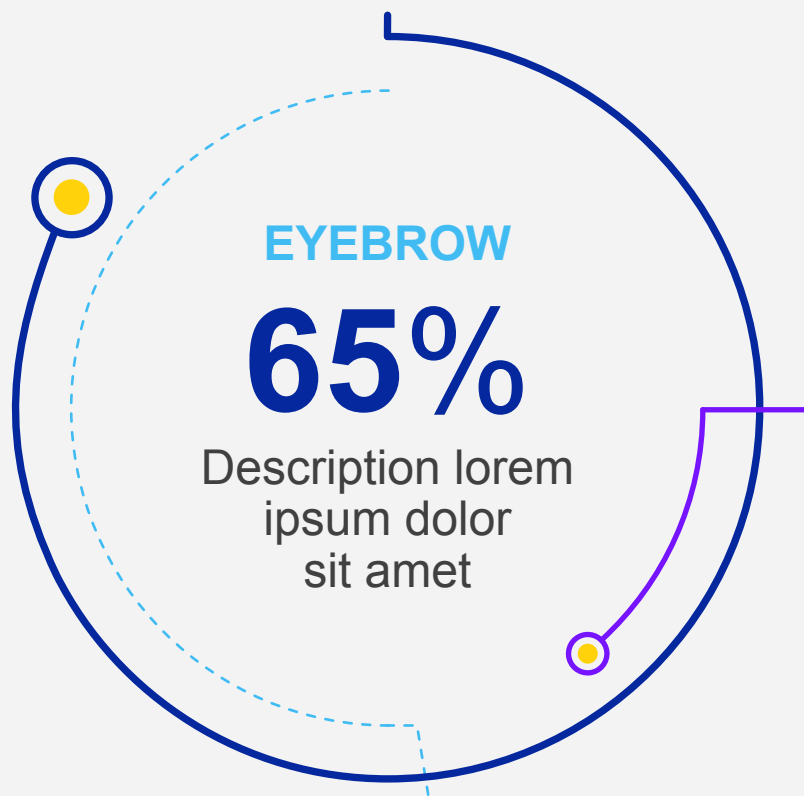
Stat Layouts with Subhead and Callouts

Subhead content style

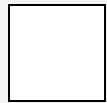


Stat Layouts with Subhead

Subhead content style



Theme Colors



White
#FFFFFF



Black
#000000



Light 2 –Background
#F4F4F4



Dark 2
#404040



Accent 1
#05299E



Accent 2
#7614FF



Accent 3
#42BCF4



Accent 4
#F97F2E



Accent 5
#99E45C



Accent 6
#FFD20C

CHARTS WARNING: If you have both Office 2003 and 2007 installed on your system there may be a bug in chart colors. To ensure that accent colors 1-6 are used we recommend opening Excel 2007 prior to working with charts. We have discovered that if Excel 2007 is not open:

1. the charting could default back to MS graph app.
2. An error box may appear asking user to close excel dialog boxes

Default Settings

Theme Fonts:

Arial (heading)

Arial (body)

Text Box:

Default: Arial Bold 20pt

Center

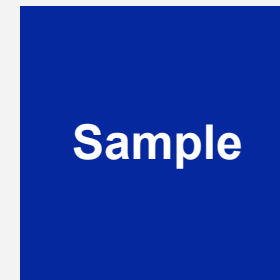
Blue, Accent 1

Line spacing [.9]

Space before [12pt]

*For Alt Text Styles only – use layout placeholders
for bulleted lists*

Drawing Style:



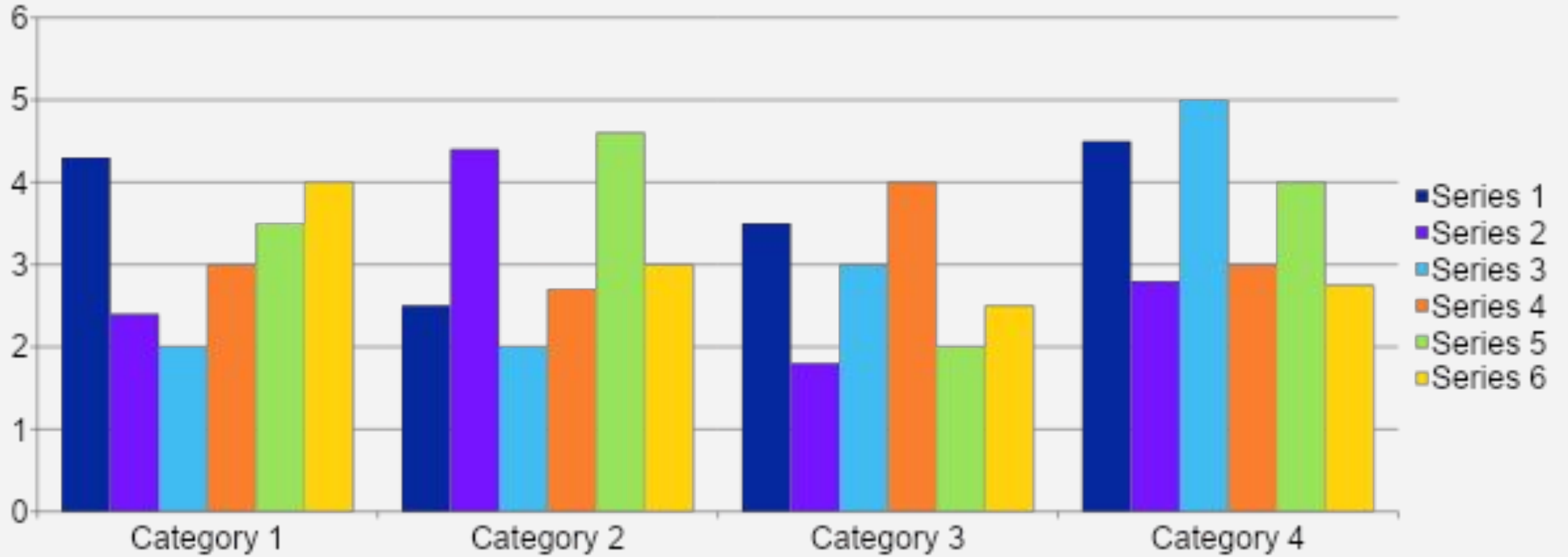
Line Style:



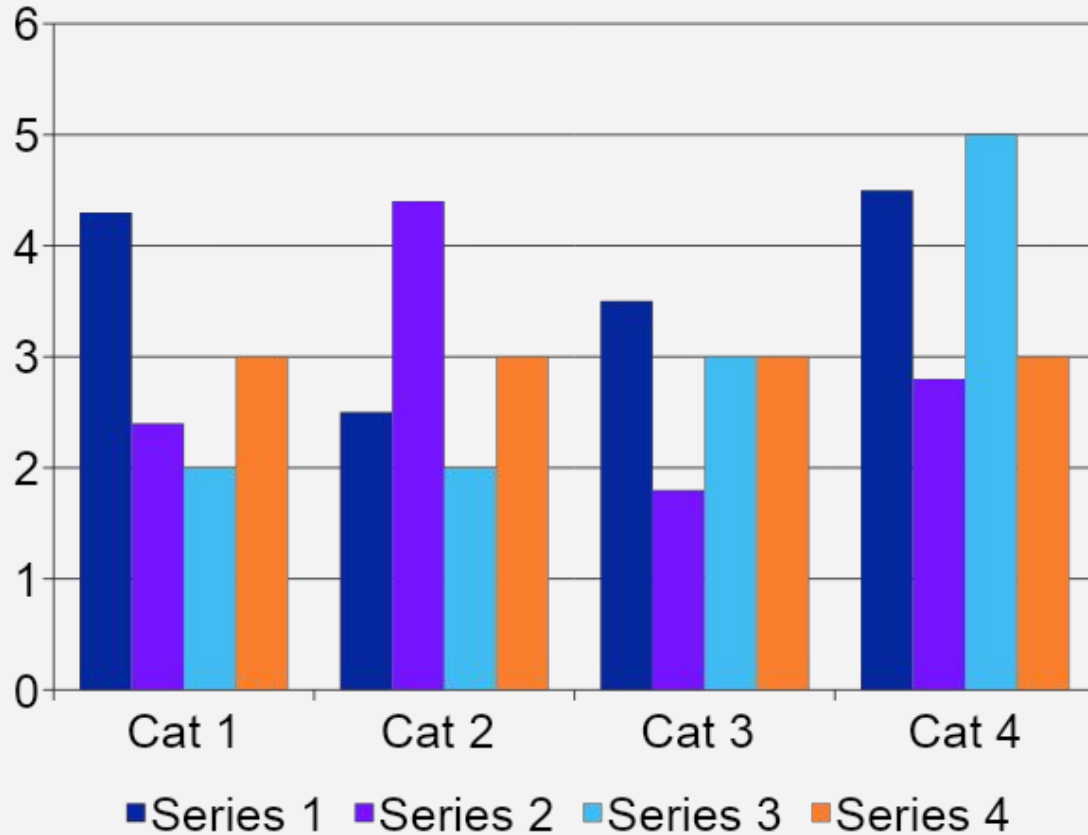
Default Table Style

Heading 1	Heading 2	Heading 3	Heading 4	Heading 5
Content	Content	Content	Content	Content
Content	Content	Content	Content	Content
Content	Content	Content	Content	Content
Content	Content	Content	Content	Content

Content Layout: Column Chart Sample

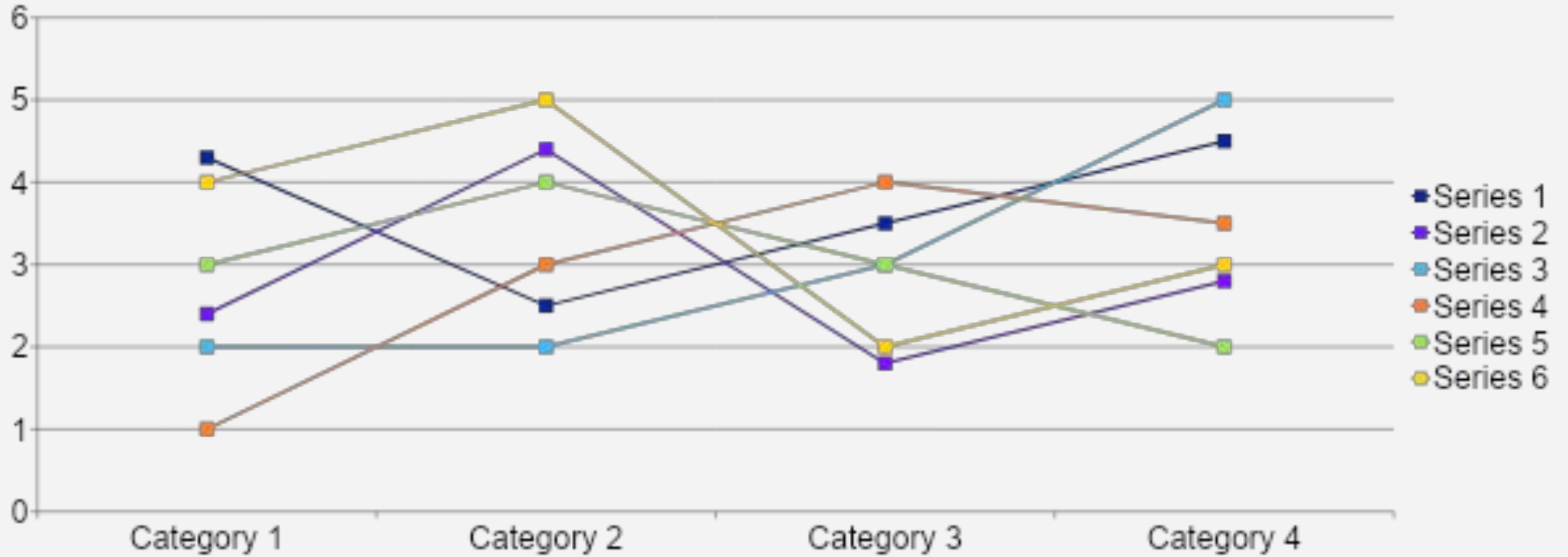


Two Content Layout: Column Chart Sample

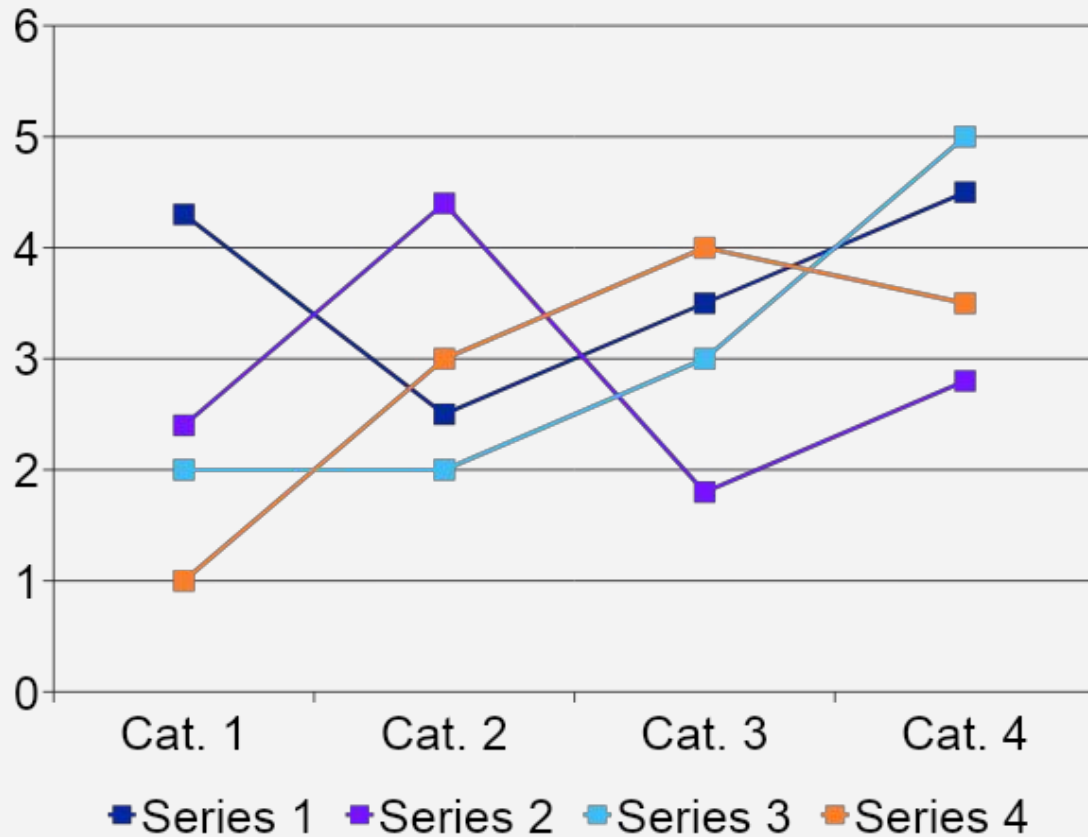


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- Left justified
- Sentence case
- First level bullet
 - Second bullet level
 - Second bullet level

Content Layout: Line Chart Sample



Two Content Layout: Line Chart Sample

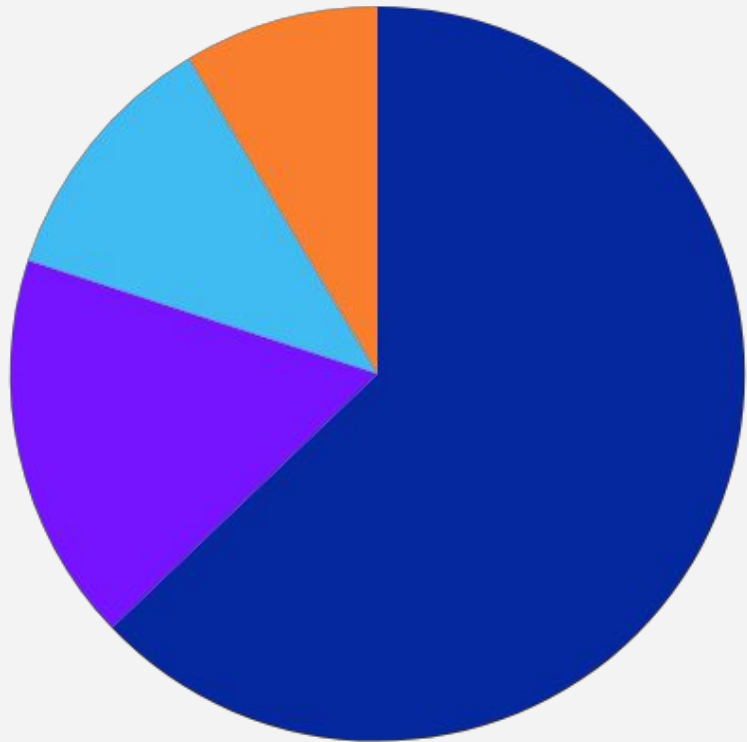


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- Left justified
- Sentence case
- First level bullet
 - Second bullet level
 - Second bullet level

Content Layout: Pie Chart Sample



Two Content Layout: Pie Chart Sample



■ Series 1 ■ Series 2 ■ Series 3 ■ Series 4

- First level bullet text
- Line spacing 0.95, before paragraph 12pt
- Left justified
- Sentence case
- First level bullet
 - Second bullet level
 - Second bullet level

Custom Column Chart

