Scalable Shiny App Deployment with Docker

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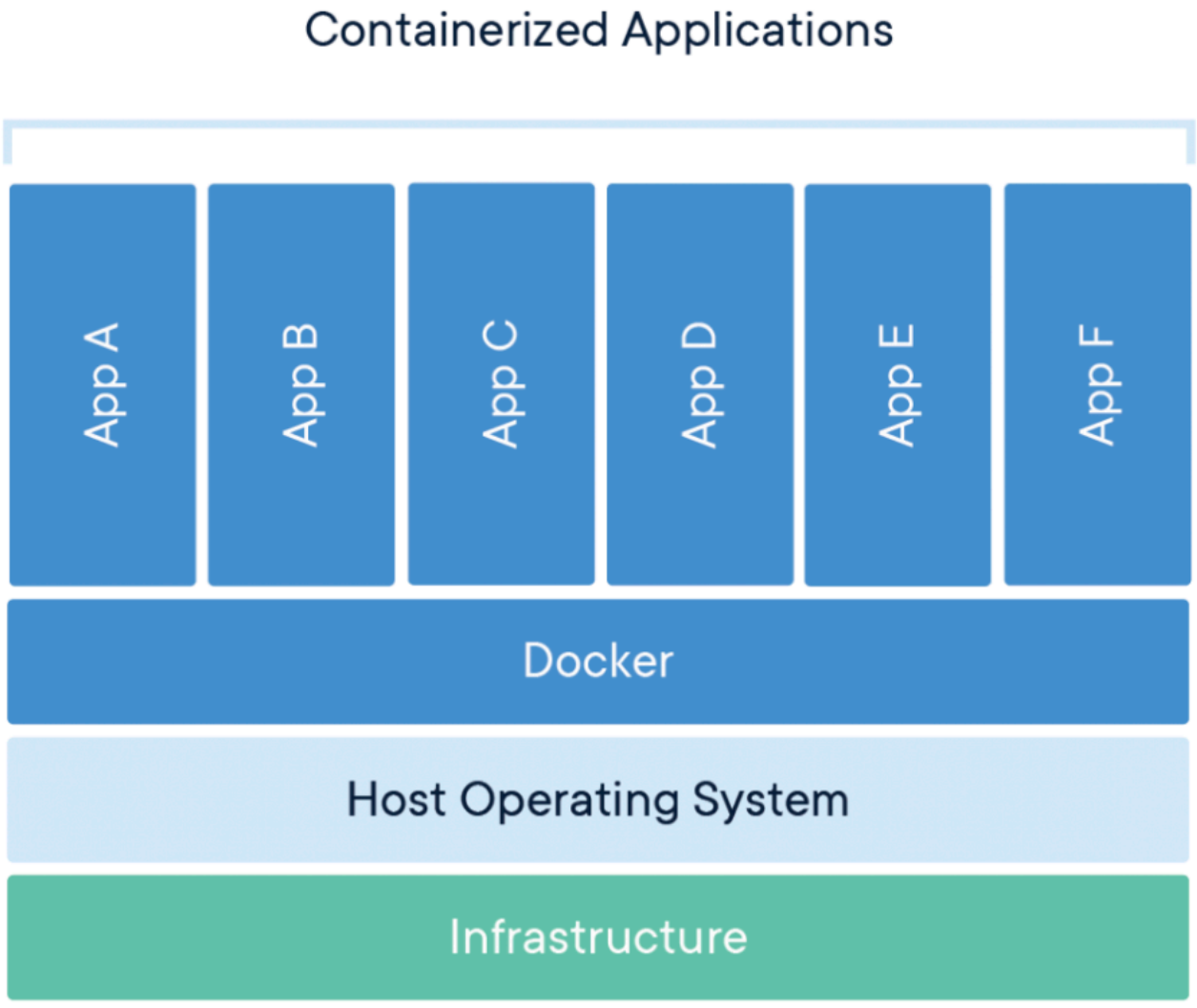
Shiny Deployment

- shinyapps.io by Posit (Cloud)
  https://www.shinyapps.io/
- Posit Connect (Enterprise)
  https://posit.co/products/enterprise/connect/
- Shiny Server (Open Source)
  https://posit.co/products/open-source/shinyserver/

Docker Containers



https://www.docker.com/resources/what-container/

Rocker Project

- Docker Containers for the R Environment
  https://rocker-project.org/
- An Introduction to Rocker: Docker Containers for R
  https://journal.r-project.org/archive/2017/RJ-2017-065/index.html
- The Rockerverse: Packages and Applications for Containerisation with R
  https://journal.r-project.org/archive/2020/RJ-2020-007/index.html

Rocker Images

image	base image	description	pulls
`rocker/r-ver`	`ubuntu`	Install R from source and set RSPM as default CRAN mirror	docker pulls 5.5M
`rocker/rstudio`	`rocker/r-ver`	Adds RStudio Server	docker pulls 26M
`rocker/tidyverse`	`rocker/rstudio`	Adds tidyverse packages & devtools	docker pulls 18M
`rocker/verse`	`rocker/tidyverse`	Adds tex & publishing-related package	docker pulls 1.5M
`rocker/geospatial`	`rocker/verse`	Adds geospatial packages	docker pulls 795k
`rocker/binder`	`rocker/geospatial`	Adds requirements to run repositories on mybinder.org	docker pulls 104k
`rocker/shiny`	`rocker/r-ver`	Adds shiny server	docker pulls 3.2M
`rocker/shiny-verse`	`rocker/shiny`	Adds tidyverse packages	docker pulls 1.1M
`rocker/cuda`	`rocker/r-ver`	Adds CUDA support to `rocker/r-ver`	docker pulls 43k
`rocker/ml`	`rocker/cuda`	Adds CUDA support to `rocker/tidyverse`	docker pulls 72k
`rocker/ml-verse`	`rocker/ml`	Adds CUDA support to `rocker/geospatial`	docker pulls 45k

Dockerfile (rocker/shiny:4.3.3)

```
# https://github.com/rocker-org/rocker-versioned2/blob/master/dockerfiles/shiny_4.3.3.Dockerfile

FROM docker.io/library/ubuntu:jammy

ENV R_VERSION="4.3.3"
ENV R_HOME="/usr/local/lib/R"
ENV TZ="Etc/UTC"

COPY scripts/install_R_source.sh /rocker_scripts/install_R_source.sh
RUN /rocker_scripts/install_R_source.sh

ENV CRAN="https://p3m.dev/cran/__linux__/jammy/2024-04-23"
ENV LANG=en_US.UTF-8

COPY scripts/bin/ /rocker_scripts/bin/
COPY scripts/setup_R.sh /rocker_scripts/setup_R.sh
RUN /rocker_scripts/setup_R.sh

ENV S6_VERSION="v2.1.0.2"
ENV SHINY_SERVER_VERSION="latest"
ENV PANDOC_VERSION="default"

COPY scripts/install_shiny_server.sh /rocker_scripts/install_shiny_server.sh
COPY scripts/install_s6init.sh /rocker_scripts/install_s6init.sh
COPY scripts/install_pandoc.sh /rocker_scripts/install_pandoc.sh
COPY scripts/init_set_env.sh /rocker_scripts/init_set_env.sh
RUN /rocker_scripts/install_shiny_server.sh

EXPOSE 3838
CMD ["/init"]

COPY scripts /rocker_scripts
```

Shiny Container

```
docker run -d -p 3838:3838 rocker/shiny:4.3.3
```

Welcome to Shiny Server!

If you're seeing this page, that means Shiny Server is installed and running. **Congratulations!**

What's Next?

Now you're ready to setup Shiny — if you haven't already — and start deploying your Shiny applications.

If you see a Shiny application running on the right side of this page, then Shiny is configured properly on your server and already running an example. Bravo! You can see this application on your server at /sample-apps/hello/.

If you see a gray box or an error message, then there's a bit more work to do to get Shiny running fully. You can continue with the installation instructions or use the Admin Guide for more information. If you're seeing an error message in the panel to the right, you can use it to help diagnose what may be wrong. If you think Shiny is installed and setup properly and things still aren't working, you can look in the Shiny Server log which may have more information about what's wrong. By default, the log is stored in `/var/log/shiny-server.log`.

If you're really stuck *and you've read the relevant sections in the Admin Guide* then please ask for help on our RStudio Community forum.

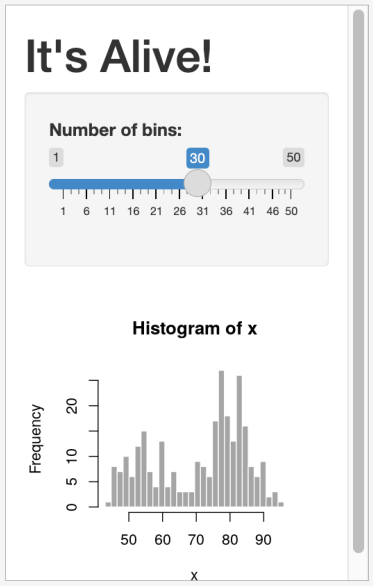
`rmarkdown`

Once you have Shiny working properly (the top application on the right sidebar), you can optionally proceed to setup rmarkdown to enable your server to host Shiny docs using the `rmarkdown` package.

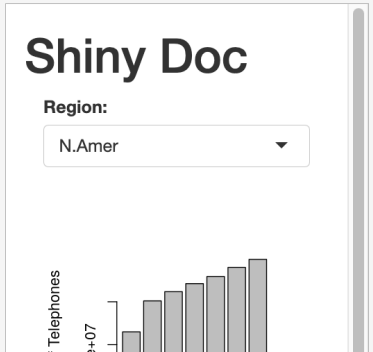
Once you have `rmarkdown` installed, the lower example to the right should also be available. Once both examples are running, you're all set to host both Shiny applications and Shiny docs!

All Done?

Once you can see the Shiny application on the right, you're off to the races! You can look at shiny.rstudio.com to take a deeper dive into Shiny or take a look at some of the Shiny Server Quick Start Guides to learn about some of the different things Shiny Server can do.



When Shiny is properly configured on your server, you'll see a Shiny app above.



DEMO

- Create Amazon EC2 Instance
- Install Docker Engine on EC2
- Pull Docker Image from rocker/shiny
- Run Docker Container with Shiny Server
- Deploy Shiny Apps to Shiny Server