Rocker: Using R on Docker

Tutorial Proposal for useR! 2015

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Goals: The focus of the tutorial is on using Docker [2] containers with R.

Justification: Docker has emerged as one of the most significant recent technology advances by providing "containers". These are *easily deployable* file-based environments, which are at the same time *standardized*, *easy to share and reuse* and *highly portable* while being *light on resource usage*. Docker builds on features in the Linux kernel which permit inexpensive separation of *processes* making is both faster to deploy and lighter on resource use than traditional virtual machine setups. By utilizing a layer providing by the easily-installed *boot2docker* wrapper, OS X and Windows user can also take advantage of Docker.

A key aspect of Docker is the "hub" service to deploy (and upload) pre-built containers. The basic Rocker container [1] provides a base R installation. It has recently been promoted to be *the* default Docker container for the R language. The Rocker team provides further containers with i) R-devel builds, ii) RStudio Server, iii) a large part of the Hadleyverse, iv) a collection of rOpenSci packages, and more.

Outline: The tutorial will be split in several parts. We plan to introduce and motivate basic interactive Docker use via the popular RStudio Server container, along with an introduction to committing, pushing and pulling containers in part one.

Part two focusses on command-line mode examining Docker use in more detail, including how to *link* filesystems between the host machine and the Docker instance.

Part three then examines writing and modifying Dockerfiles for both local use and Docker Hub uploads, based on several examples from the more advanced Rocker containers of the Rocker project.

Prerequisites: Basic knowledge of *R*; a laptop, preferably with the ability to run Docker (*boot2docker* on Windows and OS X; natively on Linux) is helpful but not required. We aim to provide relevant technical notes prior to the tutorial.

Potential Attendees: Any R users curious about R and Docker.

References

[1] Boettiger, C. and D. Eddelbuettel (2014). Rocker: R Docker Containers. https://github.com/rocker-org.

[2] Docker (2015). Docker: An open platform for distributed applications for developers and sysadmins. https://www.docker.com.