Setting Up and Using RStudio Online (Posit Cloud)

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Abstract

This document provides an overview of accessing and using RStudio online via Posit Cloud (formerly known as RStudio Cloud), a web-based platform designed to facilitate R programming and data analysis from any internet-enabled device. The guide covers essential steps for creating and managing projects in Posit Cloud, leveraging cloud storage. Through this guide, users will gain a clear understanding of how to effectively use Posit Cloud for both individual work and collaborative data science projects, providing flexibility and convenience for remote R programming.

A subset of the information used within this guide is taken as verbatim from `https://docs.posit.co/`.

Contents

1 Introduction

In light of the recent Transport for London (TfL) cybersecurity incident, which has disrupted day-to-day operations and restricted access to essential resources, this guide recommends the use of Posit Cloud as a reliable alternative for accessing RStudio and performing data analysis tasks. Due to the locked-down environment on TfL laptops, which limits the ability to install and update R packages or software, Posit Cloud offers a cloud-based solution that bypasses these constraints. With Posit Cloud, users can seamlessly access up-to-date versions of RStudio, work with the latest R packages, and collaborate on projects without the need for local installation or administrative privileges. This guide aims to empower users with the tools and knowledge to continue their work in a secure and flexible environment, ensuring minimal disruption despite the ongoing technical challenges.

The aspirations of the Data Science team are to host an RStudio server locally. This will operate in a very similar fashion to the proposed Posit Cloud through your web browser.

1.1 Overview of RStudio and Posit Cloud

RStudio is an integrated development environment (IDE) for the R programming language, designed to facilitate data analysis, statistical modelling, and data visualisation. It provides a user-friendly interface with tools for writing, debugging, and executing R code, as well as for creating reports and interactive graphics.

Posit Cloud (formerly RStudio Cloud) is a cloud-based version of RStudio that allows users to access the full capabilities of RStudio from any device with an internet connection, without the need for local installation. Posit Cloud provides a seamless environment for writing and running R code, collaborating on projects, and sharing analyses, making it particularly useful for students, educators, and data scientists who need a flexible and accessible platform for remote work and collaboration.

GDPR Notice: *"Posit is a data processor with respect to data processed by Posit Cloud Services, including posit.cloud and shinyapps.io. Posit maintains appropriate technical and organizational security measures designed to protect the security, confidentiality, integrity and availability of data processed by Posit Cloud Services. All communication between customers and Posit Cloud Services is encrypted with HTTPS. Within Posit Cloud Services, data at-rest is also encrypted. Posit has entered into a Data Processing Addendum with its Cloud Services hosting provider, Amazon Web Services, which can be found at* `https://d1.awsstatic.com/legal/aws-gdpr/AWS_GDPR_DPA.pdf`*. Customers of Posit's Cloud Services may request Posit's Data Processing Addendum (DPA) by contacting dataprocessingaddendum@posit.co."*

1.2 Purpose and Scope of the Guide

The purpose of this guide is to provide a comprehensive resource for accessing and using RStudio online through Posit Cloud, enabling users

to harness the full potential of this cloud-based platform for data analysis and collaboration. It is designed to help users —- from beginners to more advanced data scientists —- navigate the features and tools available within Posit Cloud, including project creation, code execution, and file management.

The scope of the guide includes detailed instructions on setting up an account, managing projects, collaborating with others, and optimising the cloud environment for efficient workflows. Whether for individual use or team-based projects, this guide aims to equip users with the knowledge to effectively utilise Posit Cloud for various R programming tasks, from simple data analysis to complex statistical modelling and reporting.

2 Getting Started with Posit Cloud

2.1 Creating a Posit Cloud Account

1. Go to `https://posit.cloud/`.
2. Click on "Get Started".
3. Under the "Cloud Free" option, select "Learn more".
4. Click "Sign Up".
5. Enter your details to initiate the sign up process.
6. Verify your email address and then click continue.
7. If you are directed to "Your Workspace" then you have successfully registered for a Posit Cloud Account.

2.2 Navigating the Dashboard

2.2.1 Spaces

All work in Posit Cloud takes place within a space. You may create spaces and invite others to join you there - or you may be invited to join spaces created by others. Here are some examples of space usage in Posit Cloud:

- A collaboration space for a group of researchers working together on a common project.
- A stakeholder space for a researchers to securely share work with an external stakeholder or research partner.

Every Posit Cloud user gets a personal workspace, named Your Workspace, in which to create projects and outputs. Only you can work on projects and outputs in your workspace, and by default, the projects and outputs you create there can only be accessed by you.

A shared space is an area where a group of people can collaborate together - only the members of a shared space can access the space and its contents. Figure 1 shows an overview of the Posit Cloud Dashboard and the Two Spaces available to this user – the personal workspace and a team workspace. To create a shared space, go to the navigation sidebar (click the menu icon at the upper left if needed) and choose New Space,

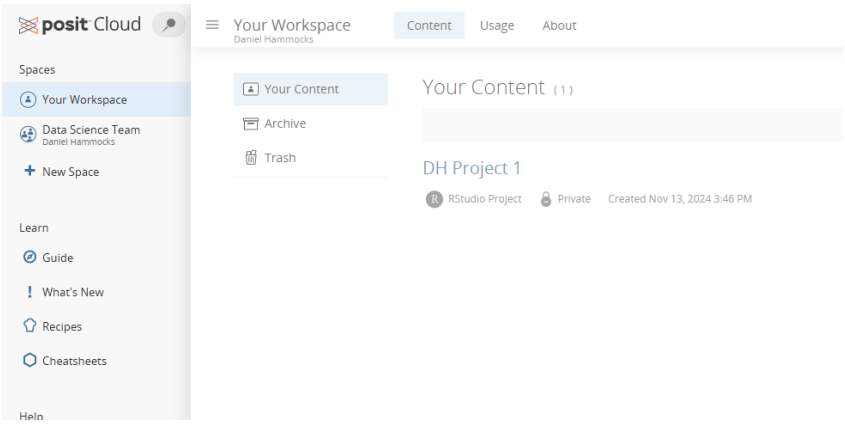

Figure 1: Posit Cloud Dashboard

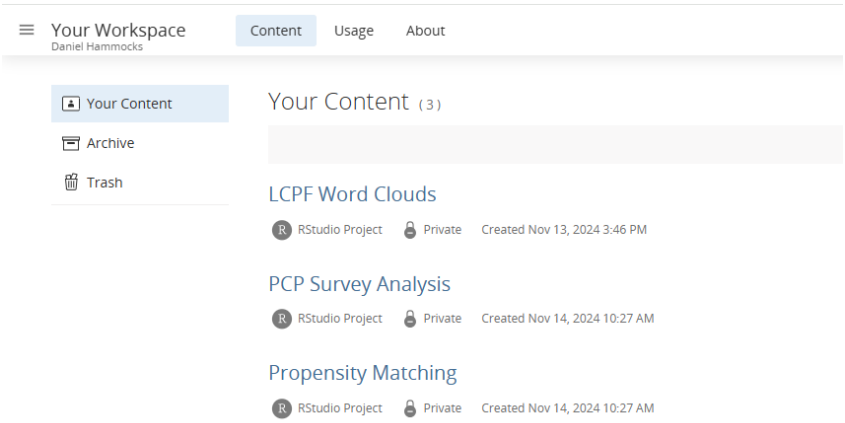

Figure 2: Posit Cloud Workspace Content Page

then follow the on-screen instructions.

2.2.2 Content Tab

Within a Workspace you have Projects, these are located within the Content Tab of a Workspace, shown in fig. 2. A project encapsulates your code, packages and data files and provides isolation from other analyses. Each project on Posit Cloud runs in its own container, independent of all other projects, with its own allocation of computational resources.

2.2.3 Usage Tab

The Usage page in the Posit Cloud workspace provides a detailed overview of your resource consumption across various projects, helping you monitor and manage usage to stay within any applicable limits. This page displays metrics such as hours spent in active sessions, the number of active projects, and storage used for files and data across your projects. For users on free or lower-tier plans, it's particularly useful for

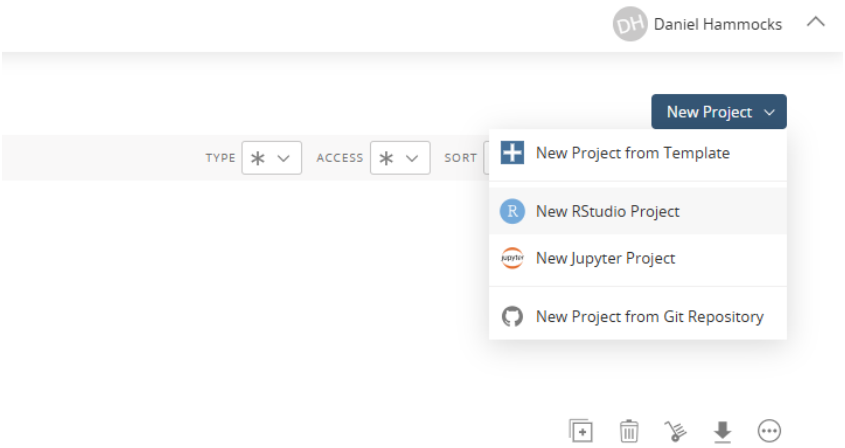

Figure 3: Posit Cloud "New Project" Menu

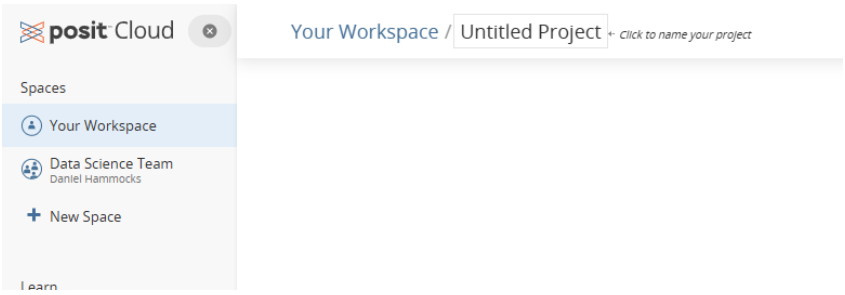

Figure 4: Posit Cloud Rename a New Untitled Project

tracking usage to avoid hitting plan limits.

3 Creating and Managing Projects

3.1 Creating a New Project from Scratch

To create a new RStudio project from scratch, navigate to the "Content" page under a "Workspace". Press the "New Project" button and choose "New RStudio Project" from the menu that appears (shown in fig. 3. Your new project will open in the RStudio IDE, fully set up for you to start coding. You can begin writing scripts, importing datasets, and installing necessary packages immediately. However, your first step should to be click where it says "Untitled Project" at the top of the screen, fig. 4, to name your project.

3.2 Creating a New Project from Git

To create a new project from a Git repository on Posit Cloud, start by clicking the "New Project" button and selecting "New Project from Git Repository" from the dropdown menu. In the next window, enter the URL of the Git repository (e.g., from GitHub, GitLab, or another service) in the provided field. If the repository is private, ensure you have the necessary credentials or SSH key set up. Click "Create Project", and Posit Cloud will clone the repository into your new project, allowing you

to work on the code, commit changes, and push updates directly from the RStudio interface.

4 Using RStudio Online

The RStudio Server interface, accessed through a web browser, offers an experience nearly identical to the Desktop version, with a similar layout, tools, and functionality. However, there are key differences tailored to its server-based nature, particularly in file management and collaborative capabilities.

4.1 Managing Files

Unlike RStudio Desktop, files in RStudio Online reside on the server. Use this method to transfer scripts, results, or data as needed:

To upload a file from your local machine:

- Go to the Files pane in the lower-right corner of the interface.
- Click the Upload button, then select the file(s) from your computer.
- The uploaded files will appear in the current working directory.

To download a file from the server to your local machine:

- Select the file in the Files pane by ticking the selection box.
- Click "More" then "Export".
- Define the filename and then click "Download".

4.2 Collaborative Features

5 Collaborating and Sharing Projects

To be added if required.

5.1 Collaborative Editing

5.2 Sharing Projects

6 Cloud Resources and File Management

To be added if required.

6.1 Cloud Storage

6.2 Uploading and Downloading Files

6.3 Working with Datasets

7 Conclusion

Posit Cloud is a robust and user-friendly platform that empowers users to access RStudio online, facilitating efficient data analysis and collaboration regardless of their physical location or local system limitations.

This guide has provided an in-depth walkthrough of setting up and navigating Posit Cloud, creating and managing projects, and leveraging its features to enhance productivity in R programming. From beginners to experienced data scientists, Posit Cloud offers a versatile environment for individual tasks and collaborative projects alike.

By adopting Posit Cloud, users can ensure that they always have access to the latest tools and updates in RStudio without the need for complex installations or administrative hurdles. Whether working on a secure team project or conducting independent analyses, Posit Cloud provides a seamless, secure, and scalable solution to meet a wide range of data science needs.

This guide serves as a foundation for exploring the full potential of Posit Cloud. Users are encouraged to continue experimenting with its features and resources to optimise their workflows and enhance their data analysis capabilities in this flexible, cloud-based platform.

Further resources include the following workbooks created by MOPAC—DS:

1. **Introduction to R for Crime Analysts**
    - **Language:** R
    - **Access:** `https://mopac-ds.github.io/LearningResource-Intro-to-R/`
    - **Description:** Welcome to the "Introduction to R for Crime Analysts" book! This resource is designed specifically for crime analysts who are transitioning from SPSS to R. The book is published as a Bookdown project on GitHub and provides a comprehensive guide to getting started with R, including practical examples and tips tailored to crime analysis.
2. **Best Coding Practices in R**
    - **Language:** R
    - **Access:** `https://mopac-ds.github.io/Learning-Resource-Best-Coding-`
    - **Description:** Welcome to the "Best Coding Practices in R" book! This book provides a comprehensive guide to best coding practices in R, focusing on essential aspects like script organisation, naming conventions, commenting, and version control. It aims to enhance the readability, maintainability, and collaborative potential of R code by offering practical advice on creating well-structured and clean scripts.