Rho: An Integrated System for R-based Web Applications

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The central benefits of R analysis include (a) maintanance of state across sessions (b) rapid development of customized software and (c) the extensive collection of community available Rpackages.   Unfortunately, the full benefits of R are often unavailable in web-deployment of R analysis.   To bring the full power of R to end users we have created Rho – an integrated system for web deployment of R analyses.   Our system is servlet based, supports interactive graphics, and can maintain user state. Because we maintain state across sessions, the system supports "dua l use"--- where the same analysis objects can be manipulated in "pure R" (t hrough the command line interpreter) as well as "automated R" ove r the web interface. A single servlet instance can support a variety of applications and concurrent users.   The system manages projects, users and data sources. The implementation of these enterprise scale features is mirrored within R itself as well as through the web.   The system extends the R compilation machinery to allow immediate deployment of Rpackages.   Rho is currently in use through a number of web applications related to bioinformatics, yet the infrastructure is general enough to support any Rpackage.   We have experimented with many client interfaces including java applets, SOAP services, and pure HTML. We present a sample application based on microarray analysis and a web-service for analysis of genelist content.