# Location Services R Packages

This location services R package will be a meta-package. A meta-package is a package that is comprised solely of other packages. The meta-package will be called {arcgis}.

The goal of {arcgis} is to make ArcGIS Platform services available to R users.

## Context: ArcGIS Platform and API for Python

ArcGIS Platform Services are:

* Basemaps
* Geocoding and Search
* Routing and Directions
* Data Hosting
* Data Visualization
* Maps and Data
* Spatial Analytics
* GeoEnrichment
* Places

The ArcGIS API for Python provides access to location services. The ArcGIS API for Python acts as a good reference implementation. The [key features of the API for Python](https://developers.arcgis.com/python/guide/key-features/) are:

* Authentication
* Mapping
* Geocoding
* Routing
* Spatial analysis
* Data enrichment
* Deep learning
* Administration
* Content management
* Geoprocessing

## Initial R package Goals:

An initial R package targets only “authentication”, “data hosting”, and “content management.” We want to provide R users with an Esri developed way to interact with hosted data.

### Authentication

The API for Python [lists 5 ways to authenticate](https://developers.arcgis.com/python/guide/key-features/#authentication) with a service. These are:

* Anonymously (no auth required)
* Using built-in accounts
* Enterprise identity stores
* Using OAuth2
* Using ArcGIS Pro

An initial release will focus on OAuth2, ArcGIS Pro, and username and password. This will provide the vast majority of R users with a way authorize to location services.

### Data Hosting & Content Management

Location services and the API for Python provide very thorough functionality for managing remote content. For an initial release, this R package is focused on covering the simple use cases. These are:

* reading from and writing to a Feature Service,
* updating and deleting records from a Feature Service,
* and reading from an Image Service.

More advanced content management such as search, creating groups, users, and modifying item properties is out of scope for an initial release.

## Location Services R package structure

{arcgis} will be a meta-package. A meta-package is a package that only imports other packages.

The meta-package will consist of {arcgisutils} and {arcgislayers} initially. Packages for geocoding and routing can be developed then included in the meta-package further down the road.

A meta-package approach enables more modular development, lowers the barrier for community contributions, and reduces the number of needed dependencies for production code that uses our package.

### {arcgisutils}

arcgisutils is the foundational R package from which everything is built upon. It is targeted at developers who want to build low-level functions or packages on location services.

arcgisutils contains functions for:

* creating Esri JSON
* parsing Esri JSON
* R to Esri type conversion
* authorization
* handling requests

### {arcgislayers}

arcgislayers is built upon arcgisutils’ helper functions for creating and parsing Esri JSON. It provides functions for:

* reading remote data metadata
* reading remote data into R formats
* adding, deleting, and updating features in feature services
* adding and publishing R objects as feature services

### {arcgis}

arcgis loads all lower-level R packages. It is akin to loading the {tidyverse} but much much smaller and less invasive. This is the current behavior:

library(arcgis)

Attaching core arcgis packages:  
 - {arcgisutils} v0.1.0  
 - {arcgislayers} v0.1.0

notes:

* we need to emphasize that this will be on CRAN and fundamentally open source
* arcgisbinding is inextricably linked to ArcGIS Pro and not open-source
  + it requires a license
  + it requires a window machine
* this will be on CRAN and accessible to all R users not just those that use Pro