

Package ‘rFDSN’

September 29, 2014

Type Package

Title Get Seismic Data from the International Federation of Digital Seismograph Networks

Description This package facilitates searching for and downloading seismic time series in miniSEED format (a minimalist version of the Standard for the Exchange of Earthquake Data) from International Federation of Digital Seismograph Networks repositories. This package can also be used to gather information about seismic networks (stations, channels, locations, etc) and find historical earthquake data (origins, magnitudes, etc).

Version 0.0.0

Date 2014-09-28

Depends R (>= 3.1.1), XML (>= 3.98.1.1)

Enhances RSEIS (>= 3.3.3)

License GPL (>= 3)

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NeedsCompilation no

Repository CRAN

Date/Publication 2014-09-29 15:10:04

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rFDSN-package

Get seismic data from the International Federation of Digital Seismograph Networks

Description

Gather information about seismic networks (stations, channels, locations, etc), download seismic time series in miniseed format, and find historical earthquake data (origins, magnitudes, etc).

Details

Package: rFDSN
Type: Package
Version: 0.0.0
Date: 2014-09-22
License: GPL v3

Author(s)

Daniel C. Bowman <daniel.bowman@unc.edu>

References

FDSN Web Services:
<http://www.fdsn.org/webservices/>
List of base URLs for data download:
<http://www.fdsn.org/webservices/datacenters/>

Examples

```
#Find all stations with operating vertical seismic channels
#within 2 degrees of Socorro, New Mexico,
#between 2010 and 2013
#available through the IRIS DMC server.

library(rFDSN)

## Not run:

#IRIS station server
base.url <- "http://service.iris.edu/fdsnws/station/1/"

#Selection criteria
```

```
parameters <- list(
  name = c(
    "latitude",
    "longitude",
    "maxradius",
    "cha",
    "start",
    "end"),
  value = c(
    34.068110, #Latitude
    -106.901847, #Longitude
    2, #Degrees from center point
    "*Z", #Channel (with wildcards)
    "2010-01-01", #Start time
    "2014-01-01") #End time
)

networks <- FDSNGetNetworks(base.url, parameters)

#Download pressure data at station Y22D on August 9, 2014

#IRIS data download server
base.url <- "http://service.iris.edu/fdsnws/dataselect/1/"
parameters <- list(
  name = c(
    "sta",
    "cha",
    "start",
    "end"),
  value = c(
    "Y22D", #Station name
    "BDF", #SEED channel name
    "2014-08-09T00:00:00.000", #Midnight GMT
    "2014-08-09T23:59:59.999") #Midnight GMT
)
miniseed.file <- FDSNGetTimeSeries(base.url, parameters, save.file = "Y22D_BDF.mseed")

#Get all earthquakes within 2 degrees of Socorro, new Mexico,
#between 2010 and 2013

#IRIS event server
base.url <- "http://service.iris.edu/fdsnws/event/1/"

#Selection criteria
parameters <- list(
  name = c(
    "latitude",
    "longitude",
    "maxradius",
    "start",
    "end"),
  value = c(
    34.068110, #Latitude
```

```
-106.901847, #Longitude
2, #Degrees from center point
"2010-01-01", #Start time
"2014-01-01") #End time
)

events <- FDSNGetEvents(base.url, parameters)

## End(Not run)
```

FDSNGetEvents

Download earthquake data from FDSN.

Description

This function gathers earthquake data from the International Federation of Digital Seismograph Networks. The available subsetting parameters can be viewed by calling [FDSNParameterList](#).

Usage

```
FDSNGetEvents(base.url, parameters, verbose = TRUE)
```

Arguments

base.url	The address of a FDSN server.
parameters	Selection parameters to subset results, see FDSNParameterList for available inputs and examples below for usage.
verbose	If TRUE, print the URL used to gather the earthquake data. Default TRUE.

Value

event	A structure with event location and magnitude information
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Author(s)

Daniel C. Bowman <daniel.bowman@unc.edu>

References

<http://www.fdsn.org/webservices/>

See Also

[FDSNParameterList](#)

Examples

```
## Not run:

#Get all earthquakes within 2 degrees of Socorro, new Mexico,
#between 2010 and 2013

#IRIS event server
base.url <- "http://service.iris.edu/fdsnws/event/1/"

#Selection criteria
parameters <- list(
  name = c(
    "latitude",
    "longitude",
    "maxradius",
    "start",
    "end"),
  value = c(
    34.068110, #Latitude
    -106.901847, #Longitude
    2, #Degrees from center point
    "2010-01-01", #Start time
    "2014-01-01") #End time
)

events <- FDSNGetEvents(base.url, parameters)

## End(Not run)
```

FDSNGetNetworks

Download network and station data from FDSN.

Description

This function gathers information about stations and networks from the International Federation of Digital Seismograph Networks. The available subsetting parameters can be viewed by calling [FDSNParameterList](#).

Usage

```
FDSNGetNetworks(base.url, parameters, verbose = TRUE)
```

Arguments

`base.url` The address of a FDSN server.

parameters Selection parameters to subset results, see [FDSNParameterList](#) for available inputs and examples below for usage.

verbose If TRUE, print the URL used to gather the station and network. Default TRUE.

Value

network A structure with seismic network information

Author(s)

Daniel C. Bowman <daniel.bowman@unc.edu>

References

<http://www.fdsn.org/webservices/>

See Also

[FDSNParameterList](#)

Examples

```
## Not run:

#Find all stations with operating vertical seismic channels
#within 2 degrees of Socorro, New Mexico,
#between 2010 and 2013
#available through the IRIS DMC server.

#IRIS station server
base.url <- "http://service.iris.edu/fdsnws/station/1/"

#Selection criteria
parameters <- list(
  name = c(
    "latitude",
    "longitude",
    "maxradius",
    "cha",
    "start",
    "end"),
  value = c(
    34.068110, #Latitude
    -106.901847, #Longitude
    2, #Degrees from center point
    "*Z", #Channel (with wildcards)
    "2010-01-01", #Start time
    "2014-01-01") #End time
)

networks <- FDSNGetNetworks(base.url, parameters)
```

```
## End(Not run)
```

FDSNGetTimeSeries *Download sensor time series from FDSN.*

Description

This function gathers earthquake data from the International Federation of Digital Seismograph Networks in miniseed format. The available subsetting parameters can be viewed by calling [FDSNParameterList](#).

Usage

```
FDSNGetTimeSeries(base.url, parameters, save.file = "result.mseed",  
                 save.dir = ".", verbose = TRUE)
```

Arguments

base.url	The address of a FDSN server.
parameters	Time series selection parameters, see FDSNParameterList for available inputs and examples below for usage.
save.file	What name to give the miniseed file when it has been downloaded.
save.dir	Where to save the miniseed file, defaults to the current directory.
verbose	If TRUE, download progress is displayed.

Value

file.name	The location of the downloaded file
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Author(s)

Daniel C. Bowman <daniel.bowman@unc.edu>

References

<http://www.fdsn.org/webservices/>

See Also

[FDSNParameterList](#)

Examples

```
## Not run:

#Download pressure data at station Y22D on August 9, 2014

#IRIS data download server
base.url <- "http://service.iris.edu/fdsnws/dataselect/1/"
parameters <- list(
  name = c(
    "sta",
    "cha",
    "start",
    "end"),
  value = c(
    "Y22D", #Station name
    "BDF", #SEED channel name
    "2014-08-09T00:00:00.000", #Midnight GMT
    "2014-08-09T23:59:59.999") #Midnight GMT
)
miniseed.file <- FDSNGetTimeSeries(base.url, parameters, save.file = "Y22D_BDF.mseed")

## End(Not run)
```

FDSNParameterList *Subset options for FDSN*

Description

A list and description of subset options for [FDSNGetEvents](#), [FDSNGetNetworks](#), and [FDSNGetTimeSeries](#).

Usage

```
FDSNParameterList(interface)
```

Arguments

interface Whether to show parameter list for "station", "dataselect" or "event".

Value

parameters A list describing the parameters available for data subsetting through FDSN

Author(s)

Daniel C. Bowman <daniel.bowman@unc.edu>

See Also

[FDSNGetEvents](#), [FDSNGetNetworks](#), [FDSNGetTimeSeries](#)

Examples

```
station.params <- FDSNParameterList("station")
timeseries.params <- FDSNParameterList("dataselect")
event.params <- FDSNParameterList("event")
```

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