

Package ‘RProtoBuf’

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Title R Interface to the 'Protocol Buffers' 'API' (Version 2 or 3)

Description Protocol Buffers are a way of encoding structured data in an efficient yet extensible format. Google uses Protocol Buffers for almost all of its internal 'RPC' protocols and file formats. Additional documentation is available in two included vignettes one of which corresponds to our 'JSS' paper (2016, <[doi:10.18637/jss.v071.i02](https://doi.org/10.18637/jss.v071.i02)>). A sufficiently recent version of 'Protocol Buffers' library is required; currently version 3.3.0 from 2017 is the stated minimum.

Depends R (>= 3.0.0), methods

Imports utils, stats, tools, Rcpp

LinkingTo Rcpp

Suggests tinytest

SystemRequirements ProtoBuf libraries and compiler version 3.3.0 or later; On Debian/Ubuntu these can be installed as libprotoc-dev, libprotobuf-dev and protobuf-compiler, while on Fedora/CentOS protobuf-devel and protobuf-compiler are needed. A modern compiler is required as well.

BugReports <https://github.com/eddelbuettel/rprotobuf/issues>

URL <https://github.com/eddelbuettel/rprotobuf>,
<https://dirk.eddelbuettel.com/code/rprotobuf.html>

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VignetteBuilder Rcpp

NeedsCompilation yes

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RProtoBuf-package	<i>R Interface to the Protocol Buffers API</i>
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Description

Protocol Buffers are a way of encoding structured data in an efficient yet extensible format. Google uses Protocol Buffers for almost all of its internal RPC protocols and file formats.

This package provides R API to create, manipulate, parse and serialize protocol buffer messages from R

Author(s)

Romain Francois, Dirk Eddelbuettel, Murray Stokely and Jeroen Ooms.

References

<https://github.com/eddelbuettel/rprotobuf>

See Also

[Message](#) for some examples

Examples

```
## Not run:
# an example proto file
system.file( "proto", "addressbook.proto", package = "RProtoBuf" )

# create a message of type AddressBook, defined in the example proto file
demo( "addressbook", package = "RProtoBuf" )

# using R binary connections and files to read and write messages
demo( "io", package = "RProtoBuf" )

# more documentation in the vignette
vignette( "RProtoBuf", package = "RProtoBuf" )

## End(Not run)
```

add-methods

add elements of a repeated field of a message

Description

Add elements to a repeated field of a message.

Methods

signature(object = "Message") add elements to a repeated field of a message

Examples

```
unittest.proto.file <- system.file("tinytest", "data", "unittest.proto",
  package = "RProtoBuf" )
readProtoFiles(file = unittest.proto.file)

test <- new(protobuf_unittest.TestAllTypes)
test$add("repeated_int32", 1)
test$add("repeated_int32", 2:10)
test$repeated_int32
```

ArrayInputStream-class

Class "ArrayInputStream"

Description

A [ZeroCopyInputStream](#) backed by an in-memory array of bytes

Objects from the Class

Objects can be created by the [ArrayInputStream](#) function

Slots

pointer: External pointer to the `google::protobuf::io::ArrayInputStream` C++ object

Extends

Class "[ZeroCopyInputStream](#)", directly.

Methods

See [ZeroCopyInputStream](#)

Author(s)

Romain Francois <francoisromain@free.fr>

References

The `ArrayInputStream` class from the `protobuf` C++ library.

See Also

[ZeroCopyInputStream](#) for methods

Examples

```
stream <- ArrayInputStream(as.raw(0:10))
stream$ReadRaw(5)

stringsstream <- ArrayInputStream(as.raw(c(0x74, 0x65, 0x73, 0x74, 0x69, 0x6e, 0x67)))
stringsstream$ReadString(7)

intstream <- ArrayInputStream(as.raw(c(0x9e, 0xa7, 0x05)))
intstream$ReadVarint32()
```

ArrayInputStream-methods

Creates an ArrayInputStream

Description

Constructor for [ArrayInputStream](#) objects

Methods

signature(payload = "raw", block_size = "missing") Creates a [ArrayInputStream](#) using the raw vector as the payload of the stream

signature(payload = "raw", block_size = "integer") Creates a [ArrayInputStream](#) ... same with block size.

signature(payload = "raw", block_size = "numeric") Creates a [ArrayInputStream](#) ... same with block size.

ArrayOutputStream-class

Class "ArrayOutputStream"

Description

A [ZeroCopyOutputStream](#) backed by an in-memory array of bytes

Objects from the Class

Objects can be created by the [ArrayOutputStream](#) function

Slots

pointer: External pointer to the google::protobuf::io::ArrayOutputStream C++ object

Extends

Class "[ZeroCopyOutputStream](#)", directly.

Methods

See [ZeroCopyOutputStream](#)

Author(s)

Romain Francois <francoisromain@free.fr>

References

The ArrayOutputStream class from the protobuf C++ library.

See Also

[ZeroCopyOutputStream](#) for methods

ArrayOutputStream-methods

Creates an ArrayOutputStream

Description

Constructor for [ArrayOutputStream](#) objects

Methods

`signature(size = "integer", block_size = "missing" )` Creates a [ArrayOutputStream](#) using of the given size

`signature(size = "integer", block_size = "integer" )` Creates a [ArrayOutputStream](#) ... same with block size.

`signature(size = "integer", block_size = "numeric" )` Creates a [ArrayOutputStream](#) ... same with block size.

`signature(size = "numeric", block_size = "missing" )` Creates a [ArrayOutputStream](#) using of the given size

`signature(size = "numeric", block_size = "integer" )` Creates a [ArrayOutputStream](#) ... same with block size.

`signature(size = "numeric", block_size = "numeric" )` Creates a [ArrayOutputStream](#) ... same with block size.

`as.list.Message`
Grab the protocol buffer message as an R list

Description

Utility to grab the protocol buffer message as an R list, with one item per field.

Usage

```
## S3 method for class 'Message'
as.list(x, ...)
## S3 method for class 'Descriptor'
as.list(x, ...)
## S3 method for class 'EnumDescriptor'
as.list(x, ...)
## S3 method for class 'FileDescriptor'
as.list(x, ...)
## S3 method for class 'ServiceDescriptor'
as.list(x, ...)
```

Arguments

x	A protocol buffer message, instance of Message , or a protocol message descriptor, instance of Descriptor
...	ignored

Value

For messages, a list of the content of the fields is returned.

For message type descriptors, a list containing nested type descriptors ([Descriptor](#) objects), enum type descriptors ([EnumDescriptor](#) objects), then field descriptors ([FieldDescriptor](#) objects) in that order.

For enum descriptors, a named list of the enumerated values.

For file descriptors, a named list of descriptors defined in the specified file descriptor.

For service descriptors, ...

Author(s)

Romain Francois <francoisromain@free.fr>

Examples

```
Person <- P( "tutorial.Person" )
romain <- new( Person, email = "francoisromain@free.fr", id = 1 )
as.list( romain )
as.list( Person )
as.list( Person$PhoneType)
```

asMessage

coerce an object to a protobuf message

Description

coerce an object to the [Message](#) class. This is a short-hand to the [as](#) method with the Class argument set to "Message"

Usage

```
asMessage(x, ...)
```

Arguments

x	object to coerce to a protobuf message
...	Passed to as

Value

a [Message](#) object

Author(s)

Romain Francois <francoisromain@free.fr>

Examples

```
# coerce a message type descriptor to a message
asMessage( tutorial.Person )

# coerce a enum descriptor
asMessage( tutorial.Person.PhoneType )

# coerce a field descriptor
asMessage( tutorial.Person$email )

# coerce a file descriptor
asMessage( fileDescriptor( tutorial.Person ) )
```

BackUp-methods

Backs up a number of bytes from a stream

Description

Backs up a number of bytes from a stream

See Also

[ZeroCopyInputStream](#) implements BackUp.

ByteCount-methods

The number of bytes read/written since the object was created

Description

The number of bytes read/written since the object was created

See Also

[ZeroCopyInputStream](#) implements ByteCount.

bytesize-methods	<i>The number of bytes taken by a message</i>
------------------	---

Description

The number of bytes taken by a [Message](#)

Methods

signature(object = "Message") The number of bytes the message would take when serialized

Examples

```
message <- new( tutorial.Person, name = "dddd", email = "eeeeeee", id = 1 )
bytesize( message )
```

clear-methods	<i>Clear a field or all fields of the message and set them to their default values</i>
---------------	--

Description

Clear one field or all fields of the message and set them to their default values

Methods

signature(object = "Message", field = "missing") Clear all fields of the message and set them to their default values

signature(object = "Message", field = "character") Clear the field identified by its name

signature(object = "Message", field = "integer") Clear the field identified by its tag number

signature(object = "Message", field = "numeric") Clear the field identified by its tag number

signature(object = "Message", field = "raw") Clear the field identified by its tag number

Examples

```
message <- new( tutorial.Person, name = "dddd", email = "eeeeeee", id = 1 )
writeLines( as.character( message ) )
clear( message )
# clear works also as a pseudo method :
message$clear()

writeLines( as.character( message ) )
```

```
# clear single fields
message <- new( tutorial.Person, name = "dddd", email = "eeeeeee", id = 1 )
message$clear( "name" )
writeLines( as.character( message ) )
```

clone-methods

Clone protocol buffer messages

Description

Generic "clone" function and associated method for [Message](#) objects

Methods

signature(object = "Message") clone the message

Examples

```
## Not run:
# example proto file supplied with this package
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )

# reading a proto file and creating the descriptor
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

# creating a prototype message from the descriptor
sheep <- new( Person, email = "francoisromain@free.fr", id = 2 )

# cloning the sheep
newsheep <- clone( sheep )

# clone and update at once
newsheep <- clone( sheep, id = 3 )

# this can also be used as a pseudo method
sheep$clone()
sheep$clone( id = 3 )
```

completion

*Completion support for protocol buffer messages and descriptors***Description**

These functions support completion of protocol buffer messages and descriptors.

Usage

```
## S3 method for class 'Message'
.DollarNames(x, pattern = "")
## S3 method for class 'Descriptor'
.DollarNames(x, pattern = "")
## S3 method for class 'EnumDescriptor'
.DollarNames(x, pattern = "")
## S3 method for class 'FieldDescriptor'
.DollarNames(x, pattern = "")
## S3 method for class 'FileDescriptor'
.DollarNames(x, pattern = "")
## S3 method for class 'ServiceDescriptor'
.DollarNames(x, pattern = "")
## S3 method for class 'MethodDescriptor'
.DollarNames(x, pattern = "")
## S3 method for class 'ZeroCopyInputStream'
.DollarNames(x, pattern = "")
## S3 method for class 'ZeroCopyOutputStream'
.DollarNames(x, pattern = "")
```

Arguments

x	message (Message) or descriptor (Descriptor)
pattern	filter

Value

Character vector containing potential completions.

For [Message](#) objects, completions are the fields of the message and a set of pseudo methods ("has")

For [EnumDescriptor](#) objects, completions are the names of the possible constants

For [Descriptor](#) objects, completions are the names of the fields, enum types and nested message types defined in the associated message type.

For [FileDescriptor](#) objects, completions are the names of the top-level descriptors (message, enum or service) contained in the associated file, or pseudo methods.

Author(s)

Romain Francois <francoisromain@free.fr>

Examples

```
# creating a prototype message from the descriptor
p <- new( tutorial.Person )

.DollarNames( p )
.DollarNames( tutorial.Person )
# but this is usually used with the <TAB> expansion on the command line
# <TAB> means "press the TAB key"
# p$<TAB>
# Person$<TAB>
```

ConnectionInputStream-class
Class "ConnectionInputStream"

Description

A [ZeroCopyInputStream](#) reading from a binary R connection

Objects from the Class

Objects can be created by the [ConnectionInputStream](#) function

Slots

pointer: External pointer to the `rprotobuf::ConnectionInputStream` C++ object

Extends

Class "[ZeroCopyInputStream](#)", directly.

Methods

See [ZeroCopyInputStream](#)

Author(s)

Romain Francois <francoisromain@free.fr>

References

The internal C++ class `ConnectionInputStream`

See Also

[ZeroCopyInputStream](#) for methods

ConnectionInputStream-methods

Creates an ConnectionInputStream

Description

Constructor for [ConnectionInputStream](#) objects

Methods

signature(object="connection") Creates a [ConnectionInputStream](#) reading from the given R binary connection.

ConnectionOutputStream-class

Class "ConnectionOutputStream"

Description

A [ZeroCopyOutputStream](#) writing to a binary R connection

Objects from the Class

Objects can be created by the [ConnectionOutputStream](#) function

Slots

pointer: External pointer to the rprotobuf::ConnectionOutputStream C++ object

Extends

Class "[ZeroCopyOutputStream](#)", directly.

Methods

See [ZeroCopyOutputStream](#)

Author(s)

Romain Francois <francoisromain@free.fr>

References

The internal C++ class ConnectionOutputStream

See Also

[ZeroCopyOutputStream](#) for methods

ConnectionOutputStream-methods
<i>Creates an ConnectionOutputStream</i>

Description

Constructor for [ConnectionOutputStream](#) objects

Methods

signature(object="connection") Creates a [ConnectionOutputStream](#) writing to the given R binary connection.

containing_type-methods
<i>Gets the message type descriptor that contains a descriptor</i>

Description

Gets a [Descriptor](#) describing the message type that contains the descriptor.

See Also

The method is implemented for these classes : [Descriptor](#), [EnumDescriptor](#), [FieldDescriptor](#)

Examples

```
# Containing type of a field is the message descriptor
tutorial.Person$id$containing_type()

# No containing type for the top-level message descriptor.
tutorial.Person$containing_type()
```

Descriptor-class	<i>Class "Descriptor"</i>
------------------	---------------------------

Description

full descriptive information about a protocol buffer message type. This is a thin wrapper around the C++ class Descriptor

Objects from the Class

Objects are usually created by calls to the [P](#) function.

Slots

pointer: external pointer holding a Descriptor object
type: full name of the corresponding message type

Methods

as.character signature($x = \text{"Descriptor"}$): returns the debug string of the descriptor. This is retrieved by a call to the DebugString method of the Descriptor object.

toString signature($x = \text{"Descriptor"}$): same as as.character

\$ signature($x = \text{"Descriptor"}$): retrieves a descriptor for a member of the message type. This can either be another "Descriptor" instance describing a nested type, or a [EnumDescriptor](#) object describing an enum type, or a [FieldDescriptor](#) object describing a field of the message

new signature($\text{Class} = \text{"Descriptor"}$): creates a prototype message ([Message](#)) of this descriptor

show signature($\text{object} = \text{"Descriptor"}$): simple information

containing_type signature($\text{object} = \text{"Descriptor"}$) : returns a descriptor of the message type that contains this message descriptor, or NULL if this is a top-level message type.

field_count signature($\text{object} = \text{"Descriptor"}$) : The number of fields of this message type.

nested_type_count signature($\text{object} = \text{"Descriptor"}$) : The number of nested types of this message type.

enum_type_count signature($\text{object} = \text{"Descriptor"}$) : The number of enum types of this message type.

field signature($\text{object} = \text{"Descriptor"}$) : extract a field descriptor from a descriptor. Exactly one argument of index, number or name has to be used. If index is used, the field descriptor is retrieved by position, using the field method of the google::protobuf::Descriptor C++ class. If number is used, the field descriptor is retrieved using the tag number, with the FindFieldByNumber C++ method. If name is used, the field descriptor is retrieved by name using the FindFieldByName

nested_type signature($\text{object} = \text{"Descriptor"}$) : extracts a message type descriptor that is nested in this descriptor. Exactly one argument of index of name has to be used. If index is used, the nested type will be retrieved using its position with the nested_type method of the google::protobuf::Descriptor C++ class. If name is used, the nested type will be retrieved using its name, with the FindNestedTypeByName C++ method

enum_type signature($\text{object} = \text{"Descriptor"}$) : extracts an enum type descriptor that is contained in this descriptor. Exactly one argument of index of name has to be used. If index is used, the enum type will be retrieved using its position with the enum_type method of the google::protobuf::Descriptor C++ class. If name is used, the enum type will be retrieved using its name, with the FindEnumTypeByName C++ method

[signature($x = \text{"Descriptor"}$): extracts a field identified by its name or declared tag number

names signature($x = \text{"Descriptor"}$) : extracts names of this descriptor

length signature($x = \text{"Descriptor"}$) : extracts length of this descriptor

Author(s)

Romain Francois <francoisromain@free.fr>

See Also

the [P](#) function creates "Descriptor" messages.

Examples

```
## Not run:
# example proto file supplied with this package
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )
# reading a proto file and creating the descriptor
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

# enum type
Person$PhoneType

# nested type
Person$PhoneNumber

# field
Person$email

# use this descriptor to create a message
new( Person )
```

descriptor-methods *Get the descriptor of a message*

Description

Get the [Descriptor](#) associated with a [Message](#)

Methods

signature(object = "Message") Get the descriptor of the message, as a [Descriptor](#) instance

EnumDescriptor-class *Class "EnumDescriptor"*

Description

R representation of an enum descriptor. This is a thin wrapper around the EnumDescriptor c++ class.

Objects from the Class

Objects of this class are typically retrieved as members of [Descriptor](#) objects

Slots

pointer: external pointer to the EnumDescriptor instance
name: simple name of the enum
full_name: fully qualified name
type: fully qualified name of the type that contains this enumeration

Methods

show signature(object = "EnumDescriptor"): small information
as.character signature(x = "EnumDescriptor"): returns the debug string of the enum descriptor. This is retrieved by a call to the DebugString method of the EnumDescriptor object.
toString signature(x = "EnumDescriptor"): same as as.character
\$ signature(x = "EnumDescriptor"): get the number associated with the name
has signature(object = "EnumDescriptor"): indicate if the given name is a constant present in this enum.
containing_type signature(object = "EnumDescriptor"): returns a [Descriptor](#) of the message type that contains this enum descriptor, or NULL if this is a top level enum descriptor.
length signature(x = "EnumDescriptor"): number of constants in this enum.
value_count signature(object = "EnumDescriptor"): number of constants in this enum.
value signature(object = "EnumDescriptor"): extracts an [EnumValueDescriptor](#). Exactly one argument of index, number or name has to be used. If index is used, the enum value descriptor is retrieved by position, using the value method of the C++ class. If number is used, the enum value descriptor is retrieved using the value of the constant, using the FindValueByNumber C++ method. If name is used, the enum value descriptor is retrieved using the name of the constant, using the FindValueByName C++ method.
[[] signature(x = "EnumDescriptor"): extracts field identified by its name or declared tag number
names signature(x = "EnumDescriptor"): extracts names of this enum

Author(s)

Romain Francois <francoisromain@free.fr>

References

The EnumDescriptor C++ class

See Also

The [Descriptor](#) class

Examples

```
## Not run:
# example proto file supplied with this package
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )

# reading a proto file and creating the descriptor
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

# enum type
Person$PhoneType

has(Person$PhoneType, "MOBILE")
has(Person$PhoneType, "HOME")
has(Person$PhoneType, "WORK")

has(Person$PhoneType, "FOOBAR")

length(Person$PhoneType)
```

EnumValueDescriptor-class

Class "EnumValueDescriptor"

Description

R representation of an enum value descriptor. This is a thin wrapper around the EnumValueDescriptor c++ class.

Objects from the Class

Objects of this class are typically retrieved with the value method of the [EnumDescriptor](#) class

Slots

pointer: external pointer to the EnumValueDescriptor instance
name: simple name of the enum
full_name: fully qualified name

Methods

show signature(object = "EnumValueDescriptor"): small information
as.character signature(x = "EnumValueDescriptor"): returns the debug string of the enum descriptor. This is retrieved by a call to the DebugString method of the EnumDescriptor object.
toString signature(x = "EnumValueDescriptor"): same as as.character
\$ signature(x = "EnumValueDescriptor"): invoke pseudo methods

name signature(object = "EnumValueDescriptor", full = "logical"): return the name of this enum constant.

number signature(object = "EnumValueDescriptor"): return the numeric value of this enum constant.

enum_type signature(object = "EnumDescriptor") : retrieves the [EnumDescriptor](#) related to this value descriptor.

Author(s)

Romain Francois <francoisromain@free.fr>

Examples

```
## Not run:
# example proto file supplied with this package
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )
# reading a proto file and creating the descriptor
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

# enum type
Person$PhoneType

# enum value type
value(Person$PhoneType, 1)

name(value(Person$PhoneType, 1))
name(value(Person$PhoneType, 1), TRUE)

number(value(Person$PhoneType, number=1))

enum_type(value(Person$PhoneType, number=1))
```

enum_type-methods

Extract an enum type descriptor for a nested type

Description

Extract a [EnumDescriptor](#) contained in a [Descriptor](#)

See Also

The method is implemented for the [Descriptor](#) class

enum_type_count-methods	<i>The number of enum types</i>
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Description

The number of enum types

See Also

The method is implemented for the [Descriptor](#) class

fetch-methods	<i>Fetch content of a repeated field</i>
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Description

Fetch content of a repeated field of a message

Methods

signature(object = "Message") Fetch content of a message repeated field

field-methods	<i>Extract a field descriptor</i>
---------------	-----------------------------------

Description

Extract a [FieldDescriptor](#) from a [Descriptor](#)

See Also

The method is implemented for the [Descriptor](#) class

FieldDescriptor-class *Class "FieldDescriptor"*

Description

R representation of message type field descriptor. This is a thin wrapper around the C++ class FieldDescriptor

Objects from the Class

Objects typically are retrieved from [FieldDescriptor](#)

Slots

pointer: external pointer to the FieldDescriptor c++ object
name: name of the field within the message type
full_name: Fully qualified name of the field
type: Fully qualified name of the type that contains this field

Methods

show signature(object = "FieldDescriptor"): small description
as.character signature(x = "FieldDescriptor"): returns the debug string of the field descriptor. This is retrieved by a call to the DebugString method of the FieldDescriptor object.
toString signature(x = "FieldDescriptor"): same as as.character
\$ signature(x = "FieldDescriptor"): used to invoke pseudo methods
containing_type signature(object = "FieldDescriptor") : returns a [Descriptor](#) of the message type that contains this field descriptor.
is_extension signature(object = "FieldDescriptor") : indicates if this is an extension.
number signature(object = "FieldDescriptor") : gets the declared tag number of this field.
type signature(object = "FieldDescriptor") : type of this field.
cpp_type signature(object = "FieldDescriptor") : c++ type of this field.
label signature(object = "FieldDescriptor") : label of this field.
is_required signature(object = "FieldDescriptor") : is this field required.
is_optional signature(object = "FieldDescriptor") : is this field optional.
is_repeated signature(object = "FieldDescriptor") : is this field repeated.
has_default_value signature(object = "FieldDescriptor") : indicates if this field has a default value.
default_value signature(object = "FieldDescriptor") : the default value of this field.
message_type signature(object = "FieldDescriptor") : the [Descriptor](#) for the associated message type. Generates an error if this field is not a message type field.
enum_type signature(object = "FieldDescriptor") : the [EnumDescriptor](#) for the associated enum type. Generates an error if this field is not an enum type field

Author(s)

Romain Francois <francoisromain@free.fr>

References

The FieldDescriptor C++ class

See Also

[Descriptor](#)

Examples

```
## Not run:
# example proto file supplied with this package
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )

# reading a proto file and creating the descriptor
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

# field descriptor object
Person$email

# debug string
as.character( Person$email )

# or as a pseudo method
Person$email$as.character()

Person$email$is_required()
Person$email$is_optional()
Person$email$is_repeated()

Person$email$has_default_value()
Person$email$default_value()

Person$email$is_extension()

# Get the default values
has_default_value(Person$id)
has_default_value(Person$email)
has_default_value(Person$phone)
default_value(Person$id)
default_value(Person$email)
default_value(Person$phone)

# Get the types of field descriptors
type(Person$id)
type(Person$id, as.string=TRUE)
```

```

cpp_type(Person$email)
cpp_type(Person$email, TRUE)

# Get the label of a field descriptor
label(Person$id)
label(Person$email)
label(Person$phone)
label(Person$id, TRUE)
label(Person$email, TRUE)
label(Person$phone, TRUE)
LABEL_OPTIONAL
LABEL_REQUIRED
LABEL_REPEATED

# Test if a field is optional
is_optional(Person$id)
is_optional(Person$email)
is_optional(Person$phone)

# Test if a field is repeated
is_repeated(Person$id)
is_repeated(Person$email)
is_repeated(Person$phone)

# Test if a field is required
is_required(Person$id)
is_required(Person$email)
is_required(Person$phone)

# Return the class of a message field
message_type(Person$phone)

```

field_count-methods	<i>The number of fields</i>
---------------------	-----------------------------

Description

The number of fields

See Also

The method is implemented for the [Descriptor](#) class

FileDescriptor-class *Class "FileDescriptor"*

Description

Class "FileDescriptor"

Objects from the Class

Objects are usually created using the [fileDescriptor](#) method

Slots

pointer: external pointer to a google::protobuf::FileDescriptor C++ object

package: the package name defined in the file, e.g. 'tutorial'.

filename: the filename of this FileDescriptor

Methods

\$ signature(x = "FileDescriptor"): used to invoke a pseudo method of the file descriptor or get a top level message, enum or service descriptor

toString signature(x = "FileDescriptor") : gets the debug string

as.character signature(x = "FileDescriptor") : gets the debug string

show signature(x = "FileDescriptor") : prints small text

name signature(object = "FileDescriptor") : name of the file

Author(s)

Romain Francois <francoisromain@free.fr>

See Also

[Descriptor](#)

Examples

```
# example proto file supplied with this package
desc <- P("tutorial.Person")
person <- new(desc)

person$fileDescriptor()
name(person$fileDescriptor())
# [1] "addressbook.proto"
as.character(person$fileDescriptor())
```

fileDescriptor-methods

gets the file descriptor of an object

Description

Gets the file descriptor of an object

Methods

signature(object = "Descriptor") retrieves the file descriptor associated with this descriptor

signature(object = "Message") retrieves the file descriptor associated with the descriptor of this message

signature(object = "EnumDescriptor") retrieves the file descriptor associated with the enum descriptor

signature(object = "FieldDescriptor") retrieves the file descriptor associated with the field descriptor

signature(object = "ServiceDescriptor") retrieves the file descriptor associated with the service descriptor

signature(object = "MethodDescriptor") retrieves the file descriptor associated with the method descriptor

FileInputStream-class *Class "FileInputStream"*

Description

A [ZeroCopyInputStream](#) reading from a file

Objects from the Class

Objects can be created by the [FileInputStream](#) function

Slots

pointer: External pointer to the google::protobuf::io::FileInputStream C++ object

Extends

Class "[ZeroCopyInputStream](#)", directly.

Methods

close signature(con="FileInputStream"): Flushes any buffers and closes the underlying file. Returns false if an error occurs during the process; use GetErrno to examine the error

GetErrno signature(object="FileInputStream"): If an I/O error has occurred on this file descriptor, this is the errno from that error. Otherwise, this is zero. Once an error occurs, the stream is broken and all subsequent operations will fail.

SetCloseOnDelete signature(object="FileInputStream"): set the close on delete behavior.

See [ZeroCopyInputStream](#) for inherited methods

Author(s)

Romain Francois <francoisromain@free.fr>

References

The FileInputStream class from the protobuf C++ library.

See Also

[ZeroCopyInputStream](#) for methods

FileInputStream-methods

Creates an FileInputStream

Description

Constructor for [FileInputStream](#) objects

Methods

signature(filename = "character", block_size = "logical", close.on.delete = "logical")
Creates a [FileInputStream](#) reading from the given file.

FileOutputStream-class

Class "FileOutputStream"

Description

A [ZeroCopyOutputStream](#) reading from a file

Objects from the Class

Objects can be created by the [FileOutputStream](#) function

Slots

pointer: External pointer to the google::protobuf::io::FileOutputStream C++ object

Extends

Class "[ZeroCopyOutputStream](#)", directly.

Methods

close signature(con="FileOutputStream"): Flushes any buffers and closes the underlying file. Returns false if an error occurs during the process; use GetErrno to examine the error

flush signature(con="FileOutputStream"): Flushes FileOutputStream's buffers but does not close the underlying file

GetErrno signature(object="FileInputStream"): If an I/O error has occurred on this file descriptor, this is the errno from that error. Otherwise, this is zero. Once an error occurs, the stream is broken and all subsequent operations will fail.

SetCloseOnDelete signature(object="FileOutputStream"): set the close on delete behavior.

See [ZeroCopyOutputStream](#) for inherited methods

Author(s)

Romain Francois <francoisromain@free.fr>

References

The FileOutputStream class from the protobuf C++ library.

See Also

[ZeroCopyOutputStream](#) for methods

FileOutputStream-methods

Creates an FileOutputStream

Description

Constructor for [FileOutputStream](#) objects

Methods

signature(filename = "character", block_size = "logical", close.on.delete = "logical")
Creates a [FileOutputStream](#) writing to the given file.

GetErrno-methods

Get the error number for an I/O error

Description

If an I/O error has occurred on this file descriptor, this is the errno from that error

Methods

See classes [FileInputStream](#) and [FileOutputStream](#) for implementations.

has-methods

Indicates if an object has the given field set

Description

This generic method, currently implemented for [Message](#) and [EnumDescriptor](#) indicates if the message or enum descriptor has the given field set.

For messages and non-repeated fields, a call to the HasField method of the corresponding Message is issued.

For messages and repeated fields, a call to the FieldSize method is issued, and the message is declared to have the field if the size is greater than 0.

NULL is returned if the descriptor for the message does not contain the given field at all.

For EnumDescriptors, a boolean value indicates if the given name is present in the enum definition.

Methods

has signature(object = "Message"): Indicates if the message has a given field.

has signature(object = "EnumDescriptor"): Indicates if the EnumDescriptor has a given named element.

Examples

```

unittest.proto.file <- system.file("tinytest", "data", "unittest.proto",
  package = "RProtoBuf" )
readProtoFiles(file = unittest.proto.file)

test <- new(protoBuf_unittest.TestAllTypes)
test$has("optional_int32")
# FALSE
test$add("repeated_int32", 1:10)
test$has("repeated_int32")
# TRUE
test$has("nonexistent")
# NULL

has(protoBuf_unittest.TestAllTypes$NestedEnum, "FOO")
has(protoBuf_unittest.TestAllTypes$NestedEnum, "BAR")
has(protoBuf_unittest.TestAllTypes$NestedEnum, "XXX")

```

isInitialized-methods *Indicates if a protocol buffer message is initialized*

Description

Indicates if a [Message](#) is initialized. A message is initialized if all its required fields are set.

Methods

signature(object = "Message") is the message initialized

Examples

```

message <- new( tutorial.Person, name = "" )
isInitialized( message ) # FALSE (id is not set)
message$isInitialized() # FALSE

message <- new( tutorial.Person, name = "", id = 2 )
isInitialized( message ) # TRUE
message$isInitialized() # TRUE

```

is_extension-methods	<i>Indicates if a field descriptor is an extension</i>
----------------------	--

Description

Indicates if a field descriptor is an extension

See Also

The method is implemented for the [FieldDescriptor](#) class

Examples

```
Person <- P( "tutorial.Person" )
is_extension(Person$id)
```

label-methods	<i>Gets the label of a field</i>
---------------	----------------------------------

Description

Gets the label of a field (optional, required, or repeated).

Arguments

object	A FieldDescriptor object.
as.string	If true, print a string representation of the type.

See Also

The method is implemented for the [FieldDescriptor](#) class

Examples

```
## Not run:
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

label(Person$id)
label(Person$email)
label(Person$phone)
label(Person$id, TRUE)
label(Person$email, TRUE)
label(Person$phone, TRUE)
```

LABEL_OPTIONAL
LABEL_REQUIRED
LABEL_REPEATED

merge-methods	Merge two messages of the same type
---------------	-------------------------------------

Description

Merge two [Message](#) objects of the same type.

Methods

signature(x = "Message", y = "Message") merge two messages of the same type

Errors

An error of class "IncompatibleType" is thrown if the two messages are not of the same message type.

Examples

```
m1 <- new( tutorial.Person, email = "francoisromain@free.fr" )  
m2 <- new( tutorial.Person, id = 5 )  
m3 <- merge( m1, m2 )  
writeLines( as.character( m1 ) )  
writeLines( as.character( m2 ) )  
writeLines( as.character( m3 ) )
```

Message-class	Class "Message"
---------------	-----------------

Description

R representation of protocol buffer messages. This is a thin wrapper around the Message c++ class that holds the actual message as an external pointer.

Objects from the Class

Objects are typically created by the new function invoked on a [Descriptor](#) object.

Slots

pointer: external pointer to the c++ Message object
type: fully qualified name of the message type

Methods

as.character signature(x = "Message"): returns the debug string of the message. This is built from a call to the DebugString method of the Message object

toString signature(x = "Message"): same as as.character

toTextFormat signature(x = "Message"): returns the TextFormat of the message. This is built from a call to TextFormat::PrintToString with the Message object

toDebugString signature(x = "Message"): same as as.character

toJSON signature(x = "Message"): returns the JSON representation of the message. This is built from a call to the google::protobuf::util::MessageToJsonString method and accepts two arguments preserve_proto_field_names - if FALSE (the default) convert field names to camelCase always_print_primitive_fields - whether to return the default value for missing primitive fields (default false)

\$<- signature(x = "Message"): set the value of a field of the message.

\$ signature(x = "Message"): gets the value of a field. Primitive types are brought back to R as R objects of the closest matching R type. Messages are brought back as instances of the Message class.

[[signature(x = "Message"): extracts a field identified by its name or declared tag number

[[<- signature(x = "Message"): replace the value of a field identified by its name or declared tag number

serialize signature(object = "Message"): serialize a message. If the "connection" argument is NULL, the payload of the message is returned as a raw vector, if the "connection" argument is a binary writable connection, the payload is written into the connection. If "connection" is a character vector, the message is sent to the file (in binary format).

show signature(object = "Message"): displays a short text about the message

update signature(object = "Message"): set several fields of the message at once

length signature(x = "Message"): The number of fields actually contained in the message. A field counts in these two situations: the field is repeated and the field size is greater than 0, the field is not repeated and the message has the field.

setExtension signature(object = "Message"): set an extension field of the Message.

getExtension signature(object = "Message"): get the value of an extension field of the Message.

str signature(object = "Message"): displays the structure of the message

identical signature(x = "Message", y = "Message"): Test if two messages are exactly identical

== signature(e1 = "Message", e2 = "Message"): Same as identical

!= signature(e1 = "Message", e2 = "Message"): Negation of identical

all.equal signature(e1 = "Message", e2 = "Message"): Test near equality

names signature(x = "Message"): extracts the names of the message.

Author(s)

Romain Francois <francoisromain@free.fr>

References

The Message class from the C++ proto library.

See Also

`P` creates objects of class `Descriptor` that can be used to create messages.

Examples

```
## Not run:
# example proto file supplied with this package
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )

# reading a proto file and creating the descriptor
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

PhoneNumber <- P( "tutorial.Person.PhoneNumber" )

# creating a prototype message from the descriptor
p <- new( Person )
p$email # not set, returns default value
p$id    # not set, returns default value
as.character( p ) # empty
has( p, "email" ) # is the "email" field set
has( p, "phone" ) # is the "email" field set
length( p )      # number of fields actually set

# update several fields at once
romain <- update( new( Person ),
  email = "francoisromain@free.fr",
  id = 1,
  name = "Romain Francois",
  phone = new( PhoneNumber , number = "+33(0)...", type = "MOBILE" )
)

# supply parameters to the constructor
dirk <- new( Person,
  email = "edd@debian.org",
  id = 2,
  name = "Dirk Eddelbuettel" )
# update the phone repeated field with a list of PhoneNumber messages
dirk$phone <- list(
  new( PhoneNumber , number = "+01...", type = "MOBILE" ),
  new( PhoneNumber , number = "+01...", type = "HOME" ) )

# with/within style
saptarshi <- within( new(Person), {
  id <- 3
  name <- "Saptarshi Guha"
```

```

email <- "saptarshi.guha@gmail.com"
} )

# make an addressbook
book <- new( tutorial.AddressBook, person = list( romain, dirk, saptarshi ) )

# serialize the message to a file
tf <- tempfile( )
serialize( book, tf )

# the payload of the message
serialize( book, NULL )

# read the file into a new message
m <- tutorial.AddressBook$read( tf )
writeLines( as.character( m ) )
sapply( m$person, function(p) p$name )

```

MethodDescriptor-class

Class "MethodDescriptor"

Description

R representation of Service Descriptors

Objects from the Class

TODO

Slots

pointer: External pointer to a google::protobuf::MethodDescriptor C++ object

name: fully qualified name of the method

service: fully qualified name of the service that defines this method

Methods

as.character signature(x = "MethodDescriptor"): debug string of the method

toString signature(x = "MethodDescriptor"): debug string of the method

\$ signature(x = "MethodDescriptor"): ...

\$<- signature(x = "MethodDescriptor"): ...

input_type signature(object = "MethodDescriptor"): the [Descriptor](#) of the input type of the method

output_type signature(object = "MethodDescriptor"): the [Descriptor](#) of the output type of the method

Author(s)

Romain Francois <francoisromain@free.fr>

name	<i>Name or full name of a descriptor</i>
------	--

Description

name or full name of a descriptor

Methods

signature(object = "Descriptor") ...
signature(object = "FieldDescriptor") ...
signature(object = "EnumDescriptor") ...
signature(object = "ServiceDescriptor") ...
signature(object = "MethodDescriptor") ...

nested_type-methods	<i>Extract a message type descriptor for a nested type</i>
---------------------	--

Description

Extract a [Descriptor](#) nested in another [Descriptor](#)

See Also

The method is implemented for the [Descriptor](#) class

nested_type_count-methods	<i>The number of fields</i>
---------------------------	-----------------------------

Description

The number of fields

See Also

The method is implemented for the [Descriptor](#) class

Next-methods	<i>Obtains a chunk of data from the stream</i>
--------------	--

Description

Obtains a chunk of data from the stream

See Also

[ZeroCopyInputStream](#) implements Next.

number-methods	<i>Gets the declared tag number of a field</i>
----------------	--

Description

Gets the declared tag number of a field

See Also

The method is implemented for [FieldDescriptor](#) and [EnumValueDescriptor](#) classes.

Examples

```
## Not run:
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

number(Person$id)
number(Person$email)
as.character(Person)

number(value(tutorial.Person$PhoneType, name="HOME"))
```

P	<i>Protocol Buffer descriptor importer</i>
---	--

Description

The P function searches for a protocol message descriptor in the descriptor pool.

Usage

P(type, file)

Arguments

type	Fully qualified type name of the protocol buffer or extension
file	optional proto file. If given, the definition contained in the file is first registered with the pool of message descriptors

Value

An object of class [Descriptor](#) for message types or [FieldDescriptor](#) for extensions. An error is generated otherwise.

Author(s)

Romain Francois <francoisromain@free.fr>

Examples

```
## Not run:
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

cat(as.character( Person ))
```

read-methods	<i>Read a protocol buffer message from a connection</i>
--------------	---

Description

Read a [Message](#) from a connection using its associated [Descriptor](#)

Methods

signature(descriptor = "Descriptor", input = "character") Read the message from a file
signature(descriptor = "Descriptor") Read from a binary connection.
signature(descriptor = "Descriptor", input = "raw") Read the message from a raw vector

Examples

```
# example file that contains a "tutorial.AddressBook" message
book <- system.file( "examples", "addressbook.pb", package = "RProtoBuf" )

# read the message
message <- read( tutorial.AddressBook, book )

# or using the pseudo method
message <- tutorial.AddressBook$read( book )

# write its debug string
writeLines( as.character( message ) )

# grab the name of each person
sapply( message$person, function(p) p$name )

# read from a binary file connection
f <- file( book, open = "rb" )
message2 <- read( tutorial.AddressBook, f )
close( f )

# read from a message payload (raw vector)
payload <- readBin( book, raw(0), 5000 )
message3 <- tutorial.AddressBook$read( payload )
```

readASCII-methods	<i>read a message in ASCII format</i>
-------------------	---------------------------------------

Description

Method to read a Message in ASCII format

Methods

signature(descriptor = "Descriptor", input = "ANY") Read the message from a connection
(file, etc ...)
signature(descriptor = "Descriptor", input = "character") Read the message directly from
the character string

Examples

```
## Not run:
# example file that contains a "tutorial.AddressBook" message
book <- system.file( "examples", "addressbook.pb", package = "RProtoBuf" )

# read the message
message <- read( tutorial.AddressBook, book )

# Output in text format to a temporary file
out.file <- tempfile()
writeLines( as.character(message), file(out.file))

# Verify that we can read back in the message from a text file.
message2 <- readASCII( tutorial.AddressBook, file(out.file, "rb"))

# Verify that we can read back in the message from an unopened file.
message3 <- readASCII( tutorial.AddressBook, file(out.file))

\dontshow{
stopifnot( identical( message, message2) )
}

## End(Not run)
```

readJSON-methods

read a message in JSON format

Description

Method to read a Message in JSON format

Methods

signature(descriptor = "Descriptor", input = "ANY") Read the message from a connection (file, etc ...)

signature(descriptor = "Descriptor", input = "character") Read the message directly from the character string

Examples

```
## Not run:
# example file that contains a "tutorial.AddressBook" message
book <- system.file( "examples", "addressbook.pb", package = "RProtoBuf" )

# read the message
message <- read( tutorial.AddressBook, book )

# Output in text format to a temporary file
out.file <- tempfile()
```



```

writeLines( message$toJSON(), file(out.file))

# Verify that we can read back in the message from a text file.
message2 <- readJSON( tutorial.AddressBook, file(out.file, "rb"))

# Verify that we can read back in the message from an unopened file.
message3 <- readJSON( tutorial.AddressBook, file(out.file))

\dontshow{
stopifnot( identical( message, message2) )
}

## End(Not run)

```

readProtoFiles	<i>protocol buffer descriptor importer</i>
----------------	--

Description

Imports proto files into the descriptor pool that is then used by the P function to resolve message type names.

Usage

```

readProtoFiles(files, dir, package="RProtoBuf", pattern="\\.proto$", lib.loc=NULL)
readProtoFiles2(files, dir=".", pattern="\\.proto$", recursive=FALSE, protoPath=getwd())
resetDescriptorPool()

```

Arguments

files	Proto files
dir	Directory. If files is not specified, files with the "proto" extension in the dir directory are imported
package	R package name. If files and dir are missing, "proto" files in the "proto" directory of the package tree are imported.
pattern	A filename pattern to match proto files when using dir.
recursive	Whether to descend recursively into dir.
lib.loc	Library location.
protoPath	Search path for proto file imports.

Details

readProtoFiles2 is different from readProtoFiles to be consistent with the behavior of protoc command line tool in being explicit about the search path for proto import statements. In addition, we also require that both files and dir arguments are interpreted relative to protoPath, so that there is consistency in future imports of the same files through import statements of other proto files.

resetDescriptorPool clears all imported proto definitions.

Value

NULL, invisibly.

Author(s)

Romain Francois <francoisromain@free.fr>

See Also

[P](#)

Examples

```
## Not run:
# from a package
readProtoFiles(package = "RProtoBuf")

# from a directory
proto.dir <- system.file("proto", package = "RProtoBuf")
readProtoFiles(dir = proto.dir)

# set of files
proto.files <- list.files(proto.dir, full.names = TRUE)
readProtoFiles(proto.files)

## End(Not run)
```

serialize_pb

Serialize R object to Protocol Buffer Message.

Description

Serializes R objects to a general purpose protobuf message using the same rexp.proto descriptor and mapping between R objects and protobuf messages as RHIPE.

Usage

```
serialize_pb(object, connection, ...)
```

Arguments

object	R object to serialize
connection	passed on to serialize
...	additional arguments passed on to serialize

Details

Clients need both the message and the `rexp.proto` descriptor to parse serialized R objects. The latter is included in the the package installation proto directory: `system.file(package="RProtoBuf", "proto/rexp.proto")`

The following storage types are natively supported by the descriptor: character, raw, double, complex, integer, list, and NULL. Objects with other storage types, such as functions, environments, S4 classes, etc, are serialized using base R [serialize](#) and stored in the proto native type. Missing values, attributes and numeric precision will be preserved.

Examples

```
msg <- tempfile();
serialize_pb(iris, msg);
obj <- unserialize_pb(msg);
identical(iris, obj);
```

ServiceDescriptor-class

Class "ServiceDescriptor"

Description

R representation of Service Descriptors

Objects from the Class

TODO

Slots

pointer: External pointer to a `google::protobuf::ServiceDescriptor` C++ object

name: fully qualified name of the service

Methods

as.character signature(`x = "ServiceDescriptor"`): debug string of the service

toString signature(`x = "ServiceDescriptor"`): debug string of the service

show signature(`x = "ServiceDescriptor"`): ...

\$ signature(`x = "ServiceDescriptor"`): invoke pseudo methods or retrieve method descriptors contained in this service descriptor.

[[signature(`x = "ServiceDescriptor"`): extracts methods descriptors contained in this service descriptor

length signature(`x = "ServiceDescriptor"`): number of [MethodDescriptor](#)

method_count signature(`x = "ServiceDescriptor"`): number of [MethodDescriptor](#)

method signature(`x = "ServiceDescriptor"`): retrieves a [MethodDescriptor](#)

Author(s)

Romain Francois <francoisromain@free.fr>

set-methods

set a subset of values of a repeated field of a message

Description

set a subset of values of a repeated field of a message

Methods

signature(object = "Message") set a subset of values of a repeated field of a message

SetCloseOnDelete-methods

set the close on delete behavior

Description

By default, the file descriptor is not closed when a stream is destroyed, use SetCloseOnDelete(stream, TRUE) to change that.

Methods

See classes [FileInputStream](#) and [FileOutputStream](#) for implementations.

size-methods

Size of a message field

Description

The number of object currently in a given field of a protocol buffer message.

For non repeated fields, the size is 1 if the message has the field, 0 otherwise.

For repeated fields, the size is the number of objects in the array.

For repeated fields, the size can also be assigned to in order to shrink or grow the vector. Numeric types are given a default value of 0 when the new size is greater than the existing size. Character types are given a default value of "". Growing a repeated field in this way is not supported for message, group, and enum types.

Methods

signature(object = "Message") Number of objects in a message field

Examples

```
unittest.proto.file <- system.file("tinytest", "data", "unittest.proto",
  package = "RProtoBuf" )
readProtoFiles(file = unittest.proto.file)

test <- new(protobuf_unittest.TestAllTypes)
test$size("optional_int32")

test$add("repeated_int32", 1:10)
test$size("repeated_int32")
test$repeated_int32

size(test, "repeated_int32") <- 5
test$repeated_int32

size(test, "repeated_int32") <- 15
test$repeated_int32
```

sizegets	<i>Set the size of a field</i>
----------	--------------------------------

Description

Sets the size of a repeated field.

Methods

signature(object = "Message") sets the size of a message field

Skip-methods	<i>Skips a number of bytes</i>
--------------	--------------------------------

Description

Skips a number of bytes

swap-methods

swap elements of a repeated field of a message

Description

swap elements of a repeated field of a message.

Methods

signature(object = "Message") swap elements of a repeated field of a message

References

See the SwapElements of the Reflection class, part of the protobuf library.

type-methods

Gets the type or the C++ type of a field

Description

Gets the type or the C++ type of a field

Arguments

object A [FieldDescriptor](#) object.
as.string If true, print a string representation of the type.

See Also

The method is implemented for the [FieldDescriptor](#) class

Examples

```
## Not run:
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

type(Person$id)
type(Person$id, as.string=TRUE)
cpp_type(Person$email)
cpp_type(Person$email, TRUE)
```

with.Message	<i>with and within methods for protocol buffer messages</i>
--------------	---

Description

Convenience wrapper that allow getting and setting fields of protocol buffer messages from within the object

Usage

```
## S3 method for class 'Message'
with(data, expr, ...)
## S3 method for class 'Message'
within(data, expr, ...)
```

Arguments

data	A protocol buffer message, instance of Message
expr	R expression to evaluate
...	ignored

Details

The expression is evaluated in an environment that allows to set and get fields of the message

The fields of the message are mapped to active bindings (see [makeActiveBinding](#)) so that they can be accessed and modified from within the environment.

Value

with returns the value of the expression and within returns the data argument.

Author(s)

Romain Francois <francoisromain@free.fr>

Examples

```
## Not run:
proto.file <- system.file( "proto", "addressbook.proto", package = "RProtoBuf" )
Person <- P( "tutorial.Person", file = proto.file )

## End(Not run)

romain <- within( new( Person ), {
  email <- "francoisromain@free.fr"
  id <- 10L
} )
```

ZeroCopyInputStream-class

Virtual Class "ZeroCopyInputStream"

Description

R wrapper for the ZeroCopyInputStream c++ class

Objects from the Class

This is a virtual class

Slots

pointer: external pointer to the google::protobuf::io::ZeroCopyInputStream object

Methods

\$ signature(x="ZeroCopyInputStream"): invokes a method

Next signature(object="ZeroCopyInputStream"): Get a number of bytes from the stream as a raw vector.

Skip signature(object="ZeroCopyInputStream"): skip a number of bytes

BackUp signature(object="ZeroCopyInputStream"): Backs up a number of bytes, so that the next call to Next returns data again that was already returned by the last call to Next.

ByteCount signature(object="ZeroCopyInputStream"): Returns the total number of bytes read since this object was created.

ReadRaw signature(object="ZeroCopyInputStream", size = "integer"): read raw bytes from the stream

ReadRaw signature(object="ZeroCopyInputStream", size = "numeric"): read raw bytes from the stream

ReadString signature(object="ZeroCopyInputStream", size = "integer"): same as ReadRaw but formats the result as a string

ReadString signature(object="ZeroCopyInputStream", size = "numeric"): same as ReadRaw but formats the result as a string

ReadVarint32 signature(object="ZeroCopyInputStream"): Read an unsigned integer with Varint encoding, truncating to 32 bits.

ReadLittleEndian32 signature(object="ZeroCopyInputStream"): Read a 32-bit little-endian integer.

ReadLittleEndian64 signature(object="ZeroCopyInputStream"): Read a 64-bit little-endian integer. In R the value is stored as a double which loses some precision (no other way)

ReadVarint64 signature(object="ZeroCopyInputStream"): Read a 64-bit integer with varint encoding. In R the value is stored as a double which loses some precision (no other way)

Author(s)

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References

The google::protobuf::io::ZeroCopyInputStream C++ class.

See Also

TODO: add classes that extend

ZeroCopyOutputStream-class

Virtual Class "ZeroCopyOutputStream"

Description

R wrapper for the ZeroCopyOutputStream c++ class

Objects from the Class

This is a virtual class

Slots

pointer: external pointer to the google::protobuf::io::ZeroCopyOutputStream object

Methods

\$ signature(x="ZeroCopyOutputStream"): invokes a method

Next signature(object="ZeroCopyOutputStream", payload = "raw"): push the raw vector into the stream. Returns the number of bytes actually written.

BackUp signature(object="ZeroCopyOutputStream"): Backs up a number of bytes, so that the end of the last buffer returned by Next is not actually written.

ByteCount signature(object="ZeroCopyOutputStream"): Returns the total number of bytes written since this object was created.

WriteRaw signature(object="ZeroCopyOutputStream", payload = "raw"): write the raw bytes to the stream

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References

The google::protobuf::io::ZeroCopyOutputStream C++ class.

See Also

TODO: add classes that extend

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