

RProtoBuf Quick Reference Guide

Dirk Eddebuetel^a, Romain François^b, and Murray Stokely^c

^a<http://dirk.eddebuetel.com>; ^b<https://github.com/romainfrancois>; ^c<https://stokely.org>

This version was compiled on January 11, 2026

Example proto file.

```
// mark as Protocol Buffers v2 format
syntax = "proto2";

package tutorial;
option java_package = "com.example.tutorial";
option java_outer_classname = "AddressBookProtos";
message Person {
  required string name = 1;
  required int32 id = 2;
  optional string email = 3;
  enum PhoneType {
    MOBILE = 0;
    HOME = 1;
    WORK = 2;
  }
  message PhoneNumber {
    required string number = 1;
    optional PhoneType type = 2 [default = HOME];
  }
  repeated PhoneNumber phone = 4;
  extensions 100 to 199;
}
message AddressBook {
  repeated Person person = 1;
}
service EchoService {
  rpc Echo (Person) returns (Person);
}
```

Read proto description files.

```
readProtoFiles("somefile.proto")
readProtoFiles(dir = somedir)
readProtoFiles(package = AnRPackage)
```

Create a message.

```
message <- new(tutorial.Person, id = 0,
               name = "Romain Francois",
               email = "francoisromain@free.fr")
```

Serialize a message to a file or binary connection.

```
# to a file
tf1 <- tempfile()
message$serialize(tf1)

# to a binary connection
tf2 <- tempfile()
con <- file(tf2, open = "wb")
```

```
message$serialize(con)
close(con)

# retrieve the payload
message$serialize(NULL)
```

```
# [1] 0a 0f 52 6f 6d 61 69 6e 20 46 72 61 6e 63
# [15] 6f 69 73 10 00 1a 16 66 72 61 6e 63 6f 69
# [29] 73 72 6f 6d 61 69 6e 40 66 72 65 65 2e 66
# [43] 72
```

Read a message from a file or binary connection.

```
# from a file
tutorial.Person$read(tf1)
# from a connection
con <- file(tf2, open = "rb")
tutorial.Person$read(con)
close(con)
```

Get/Set fields.

```
email <- message$email
message$id <- 2
message[["name"]] <- "Romain"
id <- message[[2]] # tag number for 'id'
```

Message methods.

has	Indicates if a message has a given field.
clone	Creates a clone of the message
isInitialized	Indicates if a message has all its required fields set
serialize	serialize a message to a file or a binary connection or retrieve the message payload as a raw vector
clear	Clear one or several fields of a message, or the entire message
size	The number of elements in a message field
bytesize	The number of bytes the message would take once serialized
swap	swap elements of a repeated field of a message
set	set elements of a repeated field
fetch	fetch elements of a repeated field
add	add elements to a repeated field
str	the R structure of the message
as.character	character representation of a message
toString	character representation of a message (same as as.character)
update	updates several fields of a message at once
descriptor	get the descriptor of the message type of this message

More info.

Full Vignette	<code>vignette("RProtoBuf-intro")</code>
JSS Paper	<code>vignette("RProtoBuf-paper")</code>
Protocol Buffers	https://protobuf.dev/
RProtoBuf	https://github.com/eddebuetel/rprotobuf