Package ‘dialr’

June 27, 2019

**Title**  Parse, Format, and Validate International Phone Numbers

**Version**  0.3.0

**Description**  Parse, format, and validate international phone numbers using Google's 'libphonenumber' java library, <https://github.com/googlei18n/libphonenumber>.

**License**  GPL-3

**URL**  https://socialresearchcentre.github.io/dialr,
  https://github.com/socialresearchcentre/dialr,
  https://github.com/socialresearchcentre/dialrjars,
  https://github.com/googlei18n/libphonenumber

**BugReports**  https://github.com/socialresearchcentre/dialr/issues

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**Author**  Danny Smith [aut, cre],
            The Social Research Centre [cph]

**Maintainer**  Danny Smith <danny@gorcha.org>

**Repository**  CRAN

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check_cc

Description

Check whether an ISO country code is valid.

Usage

check_cc(country)

Arguments

country       A character vector of ISO country codes.

Value

A logical vector flagging which elements are valid codes.

Examples

check_cc(c("AU", "US", "CN", "WRONG", NA))
### Description

Produces example phone numbers for the given `region`, `type` and valid combinations. Input vectors are recycled as necessary if a vector of length 1 is provided.

### Usage

```r
get_example(region, type = NULL, valid = TRUE)
```

### Arguments

- **region** A character vector of ISO country codes.
- **type** A character vector of phone number types for each region. If NULL (default), returns an example "FIXED_LINE" number. Returns an empty phone number if type is not valid for the provided region.
- **valid** A logical vector. For each FALSE entry, `get_example` returns an example invalid number, and type is ignored.

### Value

A phone vector.

### libphonenumber reference

`get_example()`:

- `PhoneNumberUtil.getExampleNumberForType()`:
  - `PhoneNumberUtil.getExampleNumber()` if type is NULL or NA;
  - `PhoneNumberUtil.getInvalidExampleNumber()` if valid is FALSE.

### See Also

- `get_supported_regions()` for valid region codes, `get_types_for_region()` to get valid phone types for a region.
- Other phone functions: `dialr-match`, `dialr-phone`, `dialr-region`, `dialr-type`, `dialr-valid`, `dialr`

### Examples

```r
# Get a basic example number
get_example("AU")

# Get an example mobile number
get_example("AU", type = "MOBILE")

# Example phone number for an invalid type
get_example("AU", type = "VOICEMAIL")
```
dialr-match

Phone number equality checks

Description

Check if two vectors contain matching phone numbers. See Details section for a full list of match
types. is_match() with default arguments is used to implement == and != for phone vectors.

is_match() accepts phone or atomic vectors. Atomic vectors are converted to character for com-
parison. Note that although they can contain formatting character vectors are not parsed with a
default region, so they will only ever be an "EXACT_MATCH" if a country calling code is specified
with + at the start. See Examples.

Usage

is_match(e1, e2, detailed = FALSE, strict = TRUE,
not_number_na = TRUE)

Arguments

e1 A phone or character vector.
e2 A phone or character vector.
detailed If FALSE, is_match() returns a logical vector. If TRUE, it returns a character
vector with the match type. See Details section for possible return values.
strict If TRUE, only "EXACT_MATCH" is treated as a match. If FALSE, "EXACT_MATCH",
"NSN_MATCH" and "SHORT_NSN_MATCH" are all considered a match. Ignored if
detailed = TRUE.
not_number_na If TRUE, "NOT_A_NUMBER" is converted to NA.

Details

Possible return values for is_match(x, detailed = TRUE):

- "EXACT_MATCH": The country_code, NSN, presence of a leading zero for Italian numbers and
  any extension present are the same.
- "NSN_MATCH": Either or both values has no region specified, and the NSNs and extensions are
  the same.
- "SHORT_NSN_MATCH": Either or both values has no region specified, or the region specified is
  the same, and one NSN could be a shorter version of the other number. This includes the case
  where one has an extension specified, and the other does not.
- "NOT_A_NUMBER": One of the input phone numbers failed to parse.
- "NO_MATCH": All others.

For example, the numbers +1 345 657 1234 and 657 1234 are a "SHORT_NSN_MATCH". The numbers +1 345 657 1234 and 345 657 are a "NO_MATCH".

**Value**

A logical or character vector.

**libphonenumber reference**

is_match(): PhoneNumberUtil.isNumberMatch()

**See Also**

Other phone functions: dialr-example, dialr-phone, dialr-region, dialr-type, dialr-valid, dialr

**Examples**

```r
is_match("
phone("0412 345 678", "AU"), phone("+61412345678", "AU"))
phone("0412 345 678", "AU") == phone("+61412345678", "AU")
phone("0412 345 678", "AU") != phone("+61412345678", "AU")

# character vectors are only fully specified with a country calling code
is_match("0412345678", "0412345678", detailed = TRUE)
is_match("+61412345678", "+61412345678", detailed = TRUE)

is_match(phone("0412345678", "AU"), "0412345678", detailed = TRUE)
is_match(phone("+61412345678", "AU"), "+61412345678", detailed = TRUE)
```

---

**dialr-phone**  
*Phone number parsing and formatting*

**Description**

A phone vector stores phone numbers parsed with libphonenumber for formatting and further processing.

**Usage**

```r
phone(x, region)
phone_reparse(x)
is.phone(x)
```
Arguments

- **x**: A character vector of phone numbers.
- **region**: A character vector of ISO country codes with the default region for each phone number in x. A region vector of length 1 will be recycled to the length of x. If NA or "", numbers written in international format (with a leading +) will be parsed without a default region.
- **n**: Number of elements to print.
- **...**: Additional arguments for specific methods.
- **format**: Phone number format to use from one of four standards:
  - "E164": general format for international telephone numbers from ITU-T Recommendation E.164
  - "NATIONAL": national notation from ITU-T Recommendation E.123
  - "INTERNATIONAL": international notation from ITU-T Recommendation E.123
  - "RFC3966": "tel" URI syntax from the IETF tel URI for Telephone Numbers

See notes from the libphonenumber javadocs for more details.

- **home**: ISO country code for home region. If provided, numbers will be formatted for dialing from the home region.
- **clean**: Should non-numeric characters be removed? If TRUE, keeps numbers and leading "+".
- **strict**: Should invalid phone numbers be removed? If TRUE, invalid phone numbers are replaced with NA.
- **raw**: If TRUE, the raw phone number is returned. Otherwise elements are cleaned with `format()`.

Details

libphonenumber defines the PhoneNumberUtil class, with a set of functions for extracting information from and performing processing on a parsed PhoneNumber object. A text phone number must be parsed before any other operations (e.g. checking phone number validity, formatting) can be performed. When parsing a phone number a "default region" is required to determine the processing context for non-international numbers.
A phone vector stores the raw phone number, the default region and a java Phonenumber object for each element. The java object is cached so should persist between R sessions. In case of issues, use phone_reparse() to recreate the phone vector from the original phone number and region.

Phone number parsing functions display a progress bar in interactive sessions by default. This can be disabled by setting option dialr.show_progress to FALSE.

libphonenumber reference

phone(): Phone numbers are parsed using PhoneNumberUtil.parseAndKeepRawInput(). A phone vector stores the returned PhoneNumber.PhoneNumber object alongside the original raw text and default region for later reference.

format(): PhoneNumberUtil.format() by default, or PhoneNumberUtil.formatOutOfCountryCallingNumber() if home is provided.

See Also

Other phone functions: dialr-example, dialr-match, dialr-region, dialr-type, dialr-valid, dialr

Examples

# Create a phone vector
x <- phone(c(0, 0123, "0412 345 678", "61412987654", "03 9123 4567", "+12015550123"), "AU")

is.phone(x)
print(x)
as.character(x)
format(x)
format(x, home = "AU")

# Parse international number with no default region
phone("+61412345678", NA)

# Will fail to parse if number is not in international format
phone("0412345678", NA)

# A combination can be used
phone(c("+61412345678", "0412345678"), c(NA, "AU"))

---

dialr-region

Phone number region

Description

In libphonenumber a phone number region is represented by a 2 digit ISO country code. get_region(x) returns the 2-digit ISO country code for each element of a phone vector.

Use get_supported_regions() to see a full list of supported regions.
Region can also be retrieved from an international calling code. `get_region_for_calling_code(x)` returns the main region for each provided calling code. Since multiple regions can share a single calling code, `get_regions_for_calling_code(x)` returns a list of character vectors of regions for each.

**Usage**

```r
get_region(x)
get_supported_regions()
get_region_for_calling_code(x)
get_regions_for_calling_code(x)
```

**Arguments**

- `x` A phone vector, or a vector of calling codes.

**Value**

A character vector of country codes. `get_regions_for_calling_code()` returns a list of character vectors for each provided calling code.

**libphonenumber reference**

- `get_region()`: PhoneNumberUtil.getRegionCodeForNumber()
- `get_supported_regions()`: PhoneNumberUtil.getSupportedRegions()
- `get_region_for_calling_code()`: PhoneNumberUtil.getRegionCodeForCountryCode()
- `get_regions_for_calling_code()`: PhoneNumberUtil.getRegionCodesForCountryCode()

**See Also**

Other phone functions: `dialr-example`, `dialr-match`, `dialr-phone`, `dialr-type`, `dialr-valid`, `dialr`

**Examples**

```r
# Get regions for a phone vector
x <- phone(c(8, 0123, 0412 345 678", "61412987654", "03 9123 4567", "+12015550123"), "AU")
get_region(x)

# All supported region codes
get_supported_regions()

# Primary region for a calling code
get_region_for_calling_code(c(1, 61, 84))
```
# All regions for a calling code
get_regions_for_calling_code(c(1, 61, 84))

## Description
In addition to validity, libphonenumber can identify phone number type - it is able to distinguish Fixed-line, Mobile, Toll-free, Premium Rate, Shared Cost, VoIP, Personal Numbers, UAN, Pager, and Voicemail (whenver feasible).

get_type(x) returns the phone number type for each element of a phone vector.

Valid phone number types differ by region. get_types_for_region(x) returns a list of character vectors of valid types for each provided ISO country code. Use get_supported_types() to see a full list of supported types.

## Usage
get_type(x, strict = FALSE)

get_supported_types()

get_types_for_region(x)

## Arguments

- **x**: A phone vector, or a character vector of ISO country codes.
- **strict**: If TRUE, invalid phone numbers return NA.

## Value
A character vector of phone types.

get_types_for_region() returns a list of character vectors for each provided country code.

## libphonenumber reference

get_type(): PhoneNumberUtil.getNumberType()

get_supported_types(): PhoneNumberUtil.PhoneNumberType

get_types_for_region(): PhoneNumberUtil.getSupportedTypesForRegion()

## See Also

Other phone functions: {dialr-example,dialr-match,dialr-phone,dialr-region,dialr-valid, dialr}
Examples

```r
# Get phone types for a phone vector
x <- phone(c(0, 0123, "0412 345 678", "61412987654", "03 9123 4567", "+12015550123"), "AU")
get_type(x)

# All supported phone types
get_supported_types()

# Get supported types for specified regions
get_types_for_region("AU")
get_types_for_region(c("GB", "US"))
get_types_for_region(get_supported_regions()[1:5])
```

---

dialr-valid  

*Phone number validity checks*

Description

For each element of `x`:

- `is_parsed(x)`: Was this successfully parsed?
- `is_valid(x)`: Is this a valid phone number?
- `is_possible(x)`: Is this a possible phone number? Return type depends on `detailed`.

Usage

- `is_parsed(x)`
- `is_valid(x)`
- `is_possible(x, detailed = FALSE, type = NULL)`

Arguments

- `x`  
  A phone vector.
- `detailed`  
  If `FALSE`, `is_possible` returns a logical vector. If `TRUE`, it returns a character vector with "IS_POSSIBLE" or the reason for failure. See Details section for possible return values.
- `type`  
  If provided, checks if `x` is possible for the given phone number type.

Details

Possible return values for `is_possible(x, detailed = TRUE)`:

- "INVALID_COUNTRY_CODE": The number has an invalid country calling code.
- "INVALID_LENGTH": The number is longer than the shortest valid numbers for this region, shorter than the longest valid numbers for this region, and does not itself have a number length that matches valid numbers for this region.
- "IS_POSSIBLE": The number length matches that of valid numbers for this region.
- "IS_POSSIBLE_LOCAL_ONLY": The number length matches that of local numbers for this region only (i.e. numbers that may be able to be dialled within an area, but do not have all the information to be dialled from anywhere inside or outside the country).
- "TOO_LONG": The number is longer than all valid numbers for this region.
- "TOO_SHORT": The number is shorter than all valid numbers for this region.

**libphonenumber reference**

```r
is_valid(): PhoneNumberUtil.isValidNumber()
is_possible(): PhoneNumberUtil.isPossibleNumber()
is_possible(detailed = TRUE): PhoneNumberUtil.isPossibleNumberWithReason()
is_possible(type = type): PhoneNumberUtil.isPossibleNumberForType()
is_possible(detailed = TRUE, type = type): PhoneNumberUtil.isPossibleNumberForTypeWithReason()
```

**See Also**

Other phone functions: `dialr-example`, `dialr-match`, `dialr-phone`, `dialr-region`, `dialr-type`, `dialr`

**Examples**

```r
x <- phone(c(0, 0123, "0412 345 678", "61412987654", "03 9123 4567", "+12015550123"), "AU")

is_parsed(x)
is_valid(x)

is_possible(x)
is_possible(x, detailed = TRUE)

is_possible(x, type = "MOBILE")
is_possible(x, detailed = TRUE, type = "MOBILE")
```

---

**get_carrier**

*Phone number carrier information*

**Description**

Returns a carrier name for each phone number, in the language provided in locale.

**Usage**

```r
get_carrier(x, strict = FALSE, safe = FALSE, locale = getOption("dialr.locale"))
```
Arguments

- **x**: A phone vector.
- **strict**: Should invalid phone numbers be removed? If TRUE, invalid phone numbers are replaced with NA.
- **safe**: If TRUE, gets the name of the carrier for a given phone number only when it is 'safe' to display to users. A carrier name is considered safe if the number is valid and for a region that doesn’t support mobile number portability. All other phone numbers return "".
- **locale**: The Java locale used to retrieve localised results. The default is set in option dialr.locale.

Details

The carrier name is the one the number was originally allocated to, however if the country supports mobile number portability the number might not belong to the returned carrier anymore. If no mapping is found "" is returned.

Value

A carrier name for each phone number for the given locale, or "" if the number is invalid.

libphonenumber reference

- `get_geocode()`: PhoneNumberToCarrierMapper.getNameForValidNumber() by default, or PhoneNumberToCarrierMapper.getSafeDisplayName() if safe = TRUE.

Examples

```r
x <- phone(c(0, 0123, "0412 345 678", "61412987654", "03 9123 4567", "+12015550123"), "AU")
get_carrier(x)
get_carrier(x, strict = TRUE)
get_carrier(x, safe = TRUE)
```

---

**get_cc**

Get ISO country code

Description

Get ISO country code from a country name.

Usage

```r
get_cc(country)
```

Arguments

- **country**: A character vector of country names.
get_geocode

Value
A vector of ISO country codes (NA where not found).

Examples
get_cc("Australia")
get_cc(c("Australia", "China", "United states"))

get_geocode Phone number geographical information

Description
Returns a text description for each phone number, in the language provided in locale.

Usage
get_geocode(x, home = NULL, strict = FALSE, locale = getOption("dialr.locale"))

Arguments
x A phone vector.
home ISO country code for home region. See Details.
strict Should invalid phone numbers be removed? If TRUE, invalid phone numbers are replaced with NA.
locale The Java locale used to retrieve localised results. The default is set in option dialr.locale.

Details
The description might consist of the name of the country where the phone number is from, or the name of the geographical area the phone number is from if more detailed information is available.

If a phone number is from the region specified in home, only a lower-level description will be returned, if one exists. Otherwise, the phone number's region will be returned, with optionally some more detailed information.

For example, for a user from the region "US" (United States), we would show "Mountain View, CA" for a particular number, omitting the United States from the description. For a user from the United Kingdom (region "GB"), for the same number we may show "Mountain View, CA, United States" or even just "United States".

Value
A text description for each phone number for the given locale, or "" if the number is invalid or could belong to multiple countries.


**libphonenumber reference**

`get_geocode`: PhoneNumberOfflineGeocodergetDescriptionForValidNumber().

**Examples**

```r
x <- phone(c(0, 0123, "0412 345 678", "61412987654", "03 9123 4567", "+12015550123"), "AU")
get_geocode(x)
get_geocode(x, strict = TRUE)

# Specify a home country
get_geocode(x, home = "AU")
get_geocode(x, home = "US")

# Specify a language
get_geocode(x, home = "DE", locale = "de")
```

---

**get_timezone**

*Phone number time zone*

**Description**

Retrieve a list of CLDR time zones to which a phone number belongs.

**Usage**

`get_timezone(x, strict = FALSE)`

**Arguments**

- `x` A phone vector.
- `strict` Should invalid phone numbers be removed? If TRUE, invalid phone numbers are replaced with NA.

**Details**

This function assumes the phone number is geo-localizable. Fixed-line and mobile numbers are considered possible candidates for geo-localization.

**Value**

A character vector of time zones to which each phone number belongs, separated by `;`, or the default unknown time zone "Etc/Unknown" if no other time zone was found.

**libphonenumber reference**

`get_timezone`: PhoneNumberToTime ZonesMapper.getTimeZonesForGeographicalNumber().
**ph_example**

**Examples**

```r
x <- phone(c(0, 0123, "0412 345 678", "61412987654", "03 9123 4567", "+12015550123"), "AU")
get_timezone(x)
get_timezone(x, strict = TRUE)

# Return a list
strsplit(get_timezone(x), ";")
```

---

**Description**

*ph_example* is soft-deprecated and will be removed in a future release.

**Usage**

```r
ph_example(country, type = NULL, home = NULL, clean = FALSE)
```

**Arguments**

- **country**: Character vector of region codes. If length = 1, the same region code is used for all phone numbers.
- **type**: A character vector of phone number types. If NULL (default), returns an example "FIXED_LINE" number.
- **home**: ISO country code for home country. If provided, numbers will be formatted for dialing from the home country.
- **clean**: Should non-numeric characters be removed? If TRUE, keeps numbers.

**Value**

A character vector of formatted example phone numbers.

**Examples**

```r
ph_example("AU")
ph_example("AU", type = "MOBILE")
ph_example("AU", home = "US")
ph_example("AU", clean = TRUE)
```
**ph_format**

*Format a phone number*

**Description**

*ph_format* is soft-deprecated and will be removed in a future release.

**Usage**

```r
ph_format(phone, country, format = "NATIONAL", home = NULL, clean = FALSE)
```

**Arguments**

- **phone**: Character vector of phone numbers to check
- **country**: Character vector of region codes. If length = 1, the same region code is used for all phone numbers
- **format**: Phone number format to use.
- **home**: ISO country code for home country. If provided, numbers will be formatted for dialing from the home country.
- **clean**: Should non-numeric characters be removed? If TRUE, keeps numbers

**Value**

a character vector of formatted phone numbers.

**Examples**

```r
x <- c(0, 0123, "0404 753 123", "61410123817", "+12015550123")
ph_format(x, "AU")
ph_format(x, "AU", home = "AU")
```

---

**ph_possible**

*Check if a phone number is possible for a given region*

**Description**

*ph_possible* is soft-deprecated and will be removed in a future release.

**Usage**

```r
ph_possible(phone, country, detailed = FALSE)
```

**Examples**

```r
ph_possible(10123, "AU")
```
Arguments

<table>
<thead>
<tr>
<th>phone</th>
<th>Character vector of phone numbers to check</th>
</tr>
</thead>
<tbody>
<tr>
<td>country</td>
<td>Character vector of region codes. If length = 1, the same region code is used for all phone numbers</td>
</tr>
<tr>
<td>detailed</td>
<td>If detailed = FALSE, ph_possible returns a logical vector that indicates whether the number is possible or not. If detailed = TRUE, ph_possible returns more detailed information about FALSE numbers.</td>
</tr>
</tbody>
</table>

Details

Check whether a phone number is a possible number. It provides a more lenient check than isValidNumber(PhoneNumber) in the following sense:

1. It only checks the length of phone numbers. In particular, it doesn’t check starting digits of the number.
2. It doesn’t attempt to figure out the type of the number, but uses general rules which applies to all types of phone numbers in a region. Therefore, it is much faster than isValidNumber.
3. For fixed line numbers, many regions have the concept of area code, which together with subscriber number constitute the national significant number. It is sometimes okay to dial the subscriber number only when dialing in the same area. This function will return true if the subscriber-number-only version is passed in. On the other hand, because isValidNumber validates using information on both starting digits (for fixed line numbers, that would most likely be area codes) and length (obviously includes the length of area codes for fixed line numbers), it will return false for the subscriber-number-only version.

Value

if detailed = FALSE, logical vector flagging possible phone numbers. If detailed = TRUE, character vector with detailed information about failures.

Examples

```r
x <- c(0, 0123, "0404 753 123", "61410123817", "+12015550123")
ph_possible(x, "AU")
```

---

**Description**

**ph_region** is soft-deprecated and will be removed in a future release.

**Usage**

ph_region(phone, country)
Arguments

phone  Character vector of phone numbers.
country Character vector of region codes. If length = 1, the same region code is used for all phone numbers.

Value

corresponding character vector containing the country code for each phone number.

Examples

```r
x <- c("0123", "0404 753 123", "61410123817", "+12015550123")
ph_region(x, "AU")
```

---

**ph_type**

Retrieve type for phone number

Description

*ph_type* is soft-deprecated and will be removed in a future release.

Usage

```
ph_type(phone, country)
```

Arguments

phone  Character vector of phone numbers.
country Character vector of region codes. If length = 1, the same region code is used for all phone numbers.

Value

corresponding character vector containing the phone number type for each phone number.

Examples

```r
x <- c("0123", "0404 753 123", "61410123817", "+12015550123")
ph_type(x, "AU")
```
**Description**

*ph_valid* is soft-deprecated and will be removed in a future release.

**Usage**

```
ph_valid(phone, country, strict = FALSE)
```

**Arguments**

- **phone**: Character vector of phone numbers to check
- **country**: Character vector of region codes. If length = 1, the same region code is used for all phone numbers
- **strict**: If strict = FALSE, *ph_valid* checks if the phone number is valid to dial within the given region, including correctly specified international numbers. If strict = TRUE, *ph_valid* checks if the phone number is a domestic phone number for the given region.

**Value**

logical vector flagging valid and invalid phone numbers

**Examples**

```r
x <- c(0, 0123, "0404 753 123", "61410123817", "+12015550123")
ph_valid(x, "AU")
```
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