
PyANCP Documentation

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Python ANCP (RFC 6320) client and library.

PyANCP requires Python 2.7 or later, or Python 3.2 or later.

State: **BETA**

ANCP Library Example:

```
from ancp.client import Client
from ancp.subscriber import Subscriber

# setup ancp session
client = Client(address="1.2.3.4")
if client.connect():
    # create ancp subscribers
    S1 = Subscriber(aci="0.0.0.0 eth 1", up=1024, down=16000)
    S2 = Subscriber(aci="0.0.0.0 eth 2", up=2048, down=32000)
    # send port-up for ancp subscribers
    client.port_up([S1, S2])
    # keep session active
    try:
        while client.established.is_set():
            time.sleep(1)
    except KeyboardInterrupt:
        # send port-down for ancp subscribers
        client.port_down([S1, S2])
        client.disconnect()
```

Contents:

CHAPTER 1

ANCP Client

Currently there is just an example (*bin/client.py*) which shows how to use the client library. An ANCP client is planned for future releases.

ANCP Client Library

The client library allows to setup and control sessions to an ANCP server.

2.1 Session Setup

Following an example of how to create an ANCP session.

```
from ancp.client import Client

client = Client(address="1.2.3.4")
client.connect()
```

Warning: IPv6 is currently not supported!

It is also possible to specify the source address and destination port (default 6068). The default tech type is *DSL* which can be changed to *ANY* or *PON*. The argument *timer* (default 25 seconds) specifies the interval of periodically adjacency messages to monitor the session.

```
from ancp.client import Client
from ancp.client import TechTypes

client = Client(address="1.2.3.4", source_address="1.2.3.5", port=6068,
                tech_type=TechTypes.DSL, timer=25.0)
client.connect()
```

The *connect* method creates a TCP session and starts a background thread which responds to messages from the server and generates periodically adjacency messages (*timer*).

Following an example which shows how to keep a session active until *KeyboardInterrupt*.

```
try:
    while client.established.is_set():
        time.sleep(1)
except KeyboardInterrupt:
    client.disconnect()
```

The *disconnect* method send an *ANCP RSTACK* message to the server, waits up to 1 seconds for response and closes TCP session.

2.2 ANCP Subscriber

ANCP subscribers are requires to generate *Port Up/Down Messages*.

```
from ancp.subscriber import Subscriber

S1 = Subscriber(aci="0.0.0.0 eth 1", up=1024, down=16000)
```

All supported line attributes are described in *anep/subscriber.py*. The argument *aci* is mandatory. Attributes can be updated (e.g. *S1.up=1000*) or removed (e.g. *S1.up=None*).

2.3 Port Up/Down Messages

It is possible to send multiple port up/down in a single TCP message.

```
# create ancp subscribers
S1 = Subscriber(aci="0.0.0.0 eth 1", up=1024, down=16000)
S2 = Subscriber(aci="0.0.0.0 eth 2", up=2048, down=32000)
S3 = Subscriber(aci="0.0.0.0 eth 3", up=2048, down=32000)

# send single port up message
client.port_up(S1)

# send multiple port up in a single tcp message
client.port_up([S2, S3])
```

The *port_down* method behaves similar to *port_up*.

It is also possible to update line attributes without sending a port down message.

```
# create ancp subscribers
S1 = Subscriber(aci="0.0.0.0 eth 1", up=1024, down=16000)

# send single port up message
client.port_up(S1)

# change line attributes and send port up
S1.up=768
S1.down=14000
client.port_up(S1)

# send port up again
client.port_up(S1)
```

3.1 ancp

Python ANCP Client

3.2 ancp/client.py

ANCP Client

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```
class ancp.client.AdjacencyState
```

```
    ESTAB = 4
```

```
    IDLE = 1
```

```
    SYNRCVD = 3
```

```
    SYNSENT = 2
```

```
class ancp.client.Capabilities
```

```
    OAM = 4
```

```
    TOPO = 1
```

```
class ancp.client.Client (address, port=6068, tech_type=5, timer=25.0, source_address=None)  
    ANCP Client
```

Parameters

- **address** (*str*) – ANCP server address (IPv4)
- **port** (*int*) – ANCP port (default: 6086)

- **tech_type** (`ancp.client.TechTypes`) – tech type (default=DSL)
- **timer** (`int`) – adjacency timer (default=25.0)
- **source_address** (`str`) – optional source address

connect ()

disconnect (*send_ack=False*)

port_down (*subscribers*)

send port-down message

For backwards compability single value ANCP subscribers are accepted.

Parameters subscriber (`[ancp.subscriber.Subscriber]`) – collection of ANCP subscribers

port_up (*subscribers*)

send port-up message

For backwards compability single value ANCP subscribers are accepted.

Parameters subscriber (`[ancp.subscriber.Subscriber]`) – collection of ANCP subscribers

class `ancp.client.MessageCode`

ACK = 3

RSTACK = 4

SYN = 1

SYNACK = 2

class `ancp.client.MessageType`

ADJACENCY = 10

ADJACENCY_UPDATE = 85

PORT_DOWN = 81

PORT_MANAGEMENT = 32

PORT_UP = 80

class `ancp.client.ResultCodes`

NoResult = 0

class `ancp.client.ResultFields`

AckAll = 2

Failure = 4

Ignore = 0

Nack = 1

Success = 3

```
class ancp.client.TechTypes

    ANY = 0
    DSL = 5
    PON = 1

ancp.client.tomac(v)
    Tuple to MAC Address

    Parameters v (tuple) – MAC address

    Returns MAC address

    Return type str
```

3.3 ancp/subscriber.py

ANCP Subscribers

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```
class ancp.subscriber.DataLink
    Access-Loop-Encapsulation - Data Link

    ATM_AAL5 = 0
    ETHERNET = 1

class ancp.subscriber.DslType
    DSL Types

    ADSL = 1
    ADSL2 = 2
    ADSL2P = 3
    OTHER = 0
    SDSL = 6
    VDSL1 = 4
    VDSL2 = 5

class ancp.subscriber.Encap1
    Access-Loop-Encapsulation - Encapsulation 1

    DOUBLE_TAGGED_ETHERNET = 3
    NA = 0
    SINGLE_TAGGED_ETHERNET = 2
    UNTAGGED_ETHERNET = 1

class ancp.subscriber.Encap2
    Access-Loop-Encapsulation - Encapsulation 2

    EOAAL5_LLC = 6
    EOAAL5_LLC_FCS = 5
```

```
EOAAL5_NULL = 8
EOAAL5_NULL_FCS = 7
IPOA_LLC = 3
IPOA_Null = 4
PPPOA_LLC = 1
PPPOA_NULL = 2

class ancp.subscriber.LineState
    Line States

    IDLE = 2
    SHOWTIME = 1
    SILENT = 3

class ancp.subscriber.Subscriber(aci, **kwargs)
    ANCP Subscriber

    Parameters

    • aci (str) – Access-Loop-Circuit-ID
    • ari (str) – Access-Loop-Remote-ID
    • aaci_bin (int or tuple) – Access-Aggregation-Circuit-ID-Binary
    • aaci_ascii (str) – Access-Aggregation-Circuit-ID-ASCII
    • state (ancp.subscriber.LineState) – DSL-Line-State
    • up (int) – Actual-Net-Data-Rate-Upstream
    • down (int) – Actual-Net-Data-Rate-Downstream
    • min_up (int) – Minimum-Net-Data-Rate-Upstream
    • min_down (int) – Minimum-Net-Data-Rate-Downstream
    • att_up (int) – Attainable-Net-Data-Rate-Upstream
    • att_down (int) – Attainable-Net-Data-Rate-Downstream
    • max_up (int) – Maximum-Net-Data-Rate-Upstream
    • max_down (int) – Maximum-Net-Data-Rate-Downstream
    • dsl_type (ancp.subscriber.DslType) – DSL-Type
    • data_link (ancp.subscriber.DataLink) – Access-Loop-Encapsulation - Data Link
    • encaps1 (ancp.subscriber.Encap1) – Access-Loop-Encapsulation - Encapsulation 1
    • encaps2 (ancp.subscriber.Encap2) – Access-Loop-Encapsulation - Encapsulation 2

    aaci_bin
    tlvs

class ancp.subscriber.TLV(t, val)
```

```
len
off
type
val
class ancp.subscriber.TlvType
    TLV Types
    AACI_ASCII = 3
    AACI_BIN = 6
    ACC_LOOP_ENC = 144
    ACI = 1
    ARI = 2
    ATT_DOWN = 134
    ATT_UP = 133
    DOWN = 130
    LINE = 4
    MAX_DOWN = 136
    MAX_UP = 135
    MIN_DOWN = 132
    MIN_UP = 131
    STATE = 143
    TYPE = 145
    UP = 129
```

```
ancp.subscriber.access_loop_enc(data_link, encap1, encap2)
    Create the Access Loop Tlv
```

Parameters

- **data_link** (`ancp.subscriber.DataLink`) – The Data link type
- **encap1** (`ancp.subscriber.Encap1`) – The first Encapsulation type
- **encap2** (`ancp.subscriber.Encap2`) – The second Encapsulation type

Return type *TLV*

```
ancp.subscriber.mktlvs(tlvs)
```


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