



Your Extensible Software-Defined Radio

YesDR Technical Specification

YesDR TS 04.001

Version 1.0.0
Release 1

YesDR Access Control Protocol (YACP)

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1 Scope

This Technical Specification defines the YesDR Access Control Protocol (YACP). YACP provides control-plane signaling between the YesDR Base Station (YBS) and the YesDR Access Management Function (YAMF).

YACP is conceptually aligned with the NG Application Protocol (NGAP) defined in 3GPP TS 38.413.

2 References

2.1 Normative References

- YesDR TS 01.001: YesDR Overall Architecture
- YesDR TS 02.001: YesDR Core Network Functions

2.2 Informative References

- 3GPP TS 38.413: NG Application Protocol (NGAP)
- 3GPP TS 23.501: System Architecture for the 5G System

3 Definitions, Symbols, and Abbreviations

Abbreviation	Description
YACP	YesDR Access Control Protocol
YBS	YesDR Base Station
YAMF	YesDR Access Management Function
YUE	YesDR User Equipment
NAS	Non-Access Stratum
IE	Information Element
PLMN	Public Land Mobile Network
GUTI	Globally Unique Temporary Identifier

4 Protocol Overview

YACP is a reliable control-plane protocol operating between YBS and YAMF.

YACP SHALL:

- Transport NAS messages transparently
- Establish and manage UE contexts
- Support radio resource coordination
- Support PDU session control signaling

Messages SHALL be encoded using a TLV-based format.

5 YACP Message Categories

- Interface Management
- Radio Resource Management
- UE Context Management
- NAS Transport
- Security Procedures
- PDU Session Management

6 Interface Management Procedures

6.1 YACPSignRequest

Message Type: 0x06

IE	Type	Description
GlobalNodeID	0x20	PLMN ID and Node ID
NodeName	0x21	Human-readable YBS name

6.2 YACPSignResponse

Message Type: 0x07

YAMFName	0x30	Serving YAMF name
ServedGUAMIList	0x31	Supported GUAMI list
RelativeYAMFCapacity	0x32	Relative capacity
PLMNSupportList	0x33	Supported PLMN and slice list

7 Radio Resource Management

7.1 RadioResourceRequest

Message Type: 0x08

ybs_id	0x40	YBS identifier
plmn_id	0x40	PLMN identifier
tac	0x40	Tracking Area Code

7.2 RadioResourceResponse

Message Type: 0x09

yamf_id	0x41	YAMF identifier
bandwidth_mhz	0x41	Allocated bandwidth
frequency_mhz	0x41	Allocated frequency
power_dbm	0x41	Power level

8 NAS Transport Procedures

8.1 NASRegistrationRequest

Message Type: 0x10

RAN-UE-NGAP-ID	0x55	RAN UE identifier
NAS-PDU	0x26	NAS registration message
UserLocationInformation	0x79	UE location info
RRCEstablishmentCause	0x5A	Establishment cause
AMFSetID	0x03	AMF set identifier
UEContextRequest	0x70	UE Context Request Flag

8.2 DownlinkNASTransport

Message Type: 0x29

AMF-UE-NGAP-ID	0x0A	AMF UE ID
RAN-UE-NGAP-ID	0x55	RAN UE ID
NAS-PDU	0x26	Authentication Request

8.3 UplinkNASTransport

Message Type: 0x2A

AMF-UE-NGAP-ID	0x0A	AMF UE ID
RAN-UE-NGAP-ID	0x55	RAN UE ID
NAS-PDU	0x26	Authentication Response

8.4 NASSecurityModeCommand

Message Type: 0x11

SecurityAlgorithms	0x60	Security Algorithms
NASMessageContainer	0x55	NAS Encrypted Container
GUTI	guti	GUTI

8.5 NASSecurityModeComplete

Message Type: 0x12

AMF-UE-NGAP-ID	0x0A	AMF UE ID
RAN-UE-NGAP-ID	0x55	RAN UE ID
IMEISV	0x70	IMEISV
EAPMessage	0x71	EAP Message
AdditionalSecCapabilities	0x72	Additional UE Security Capabilities

8.6 NASRegistrationAccept

Message Type: 0x13

AMF-UE-NGAP-ID	0x0A	AMF UE ID
RAN-UE-NGAP-ID	0x55	RAN UE ID
TAIList	0x80	Tracking Area Identity List
DRXParameters	0x82	Discontinuous Reception Settings
RegistrationStatus	0x83	Registration Status

9 Radio Resource Management

9.1 IdentityRequest

Message Type: 0x28

AMF-UE-NGAP-ID	0x0A	AMF UE ID
RAN-UE-NGAP-ID	0x55	RAN UE ID
NAS-PDU	0x26	Identity Request NAS PDU

9.2 Identity Response

Message Type: 0x30

UE Identity	0x50	UE identity
UE Security Capabilities	0x51	UE security capabilities
Requested NSSAI	0x52	SST + SD
PLMN ID	0x53	PLMN
Serving Network Name	0x54	Serving network name
AMF-UE-NGAP-ID	0x0A	AMF UE ID
RAN-UE-NGAP-ID	0x55	RAN UE ID

10 PDU Session Resource Procedures

10.1 PDUSessionResourceSetupRequest

Message Type: 0x20

AMF-UE-NGAP-ID	0x0A	AMF UE ID
RAN-UE-NGAP-ID	0x55	RAN UE ID
GUTI	0x62	UE identity
TEID	0x66	Tunnel endpoint ID
PDUSessionResourceList	0x4A	PDU session list

10.2 PDUSessionResourceSetupResponse

Message Type: 0x21

PDUSessionResourceListSURes4B	0x4B	Setup response list
gtp_ip	0x4B	GTP IP address
gtp_teid	0x4B	GTP TEID
ue_ip	0x4B	UE IP address