



**Core Network and Interoperability Testing (INT);
Network Interoperability Test Description for
IPv6-only services over 5G;
Part 2: Test Description**

Reference

DTS/INT-00194

Keywords

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Core Network and Interoperability Testing (INT).

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The present document provides the Test Descriptions (TDs) for IPv6-only services over 5G SA in compliance with the relevant requirements and in accordance with the Test Purposes (TPs) presented in ETSI TS 103 878-1 [1].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

- [1] [ETSI TS 103 878-1](#): "Core Network and Interoperability Testing (INT); Network Interoperability Test Description for IPv6-only services over 5G; Part 1: Test purposes".
- [2] [IETF RFC 3022](#): "Traditional IP Network Address Translator (Traditional NAT)".
- [3] [IETF RFC 6052](#): "IPv6 Addressing of IPv4/IPv6 Translators".
- [4] [IETF RFC 6146](#): "Stateful NAT64: Network Address and Protocol Translation from IPv6 Clients to IPv4 Servers".
- [5] [IETF RFC 6877](#): "464XLAT: Combination of Stateful and Stateless Translation".
- [6] [IETF RFC 7050](#): "Discovery of the IPv6 Prefix Used for IPv6 Address Synthesis".
- [7] [IETF RFC 7335](#): "IPv4 Service Continuity Prefix".
- [8] [IETF RFC 7915](#): "IP/ICMP Translation Algorithm".
- [9] [ETSI TS 123 501](#): "5G; System architecture for the 5G System (5GS); (3GPP TS 23.501)".

2.2 Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ISO/IEC 9646-1: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".
- [i.2] [IETF RFC 6147](#): "DNS64: DNS Extensions for Network Address Translation from IPv6 Clients to IPv4 Servers".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the following terms apply:

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1 [i.1].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [i.1].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [i.1].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [i.1].

DNS64: Refer to IETF RFC 6147 [i.2].

NAT64: Refer to IETF RFC 6146 [4].

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 123 501 [9], IETF RFC 6147 [i.2], IETF RFC 6877 [5] and the following apply:

3GPP	3 rd Generation Partnership Project
ATS	Abstract Test Suite
HR	Home Routing
IP	Internet Protocol
IUT	Implementation Under Test
LBO	Local Breakout
SUT	System Under Test
TP	Test Purposes
UE	User Equipment

4 Test Environment

4.1 Introduction

The following architectural test configurations are referenced in interoperability TDs of IPv6-only services over 5G, which uses 464XLAT + DNS64 protocols in 5G standalone network to provide IPv6-only services. They are intended to give a general rather than a specific view of required connections among SUTs.

To fully understand the test environment, developers should know how 464XLAT+DNS64 work and which entity will function.

4.2 Test configuration/architecture

4.2.1 Configuration CF_5G_IPv6only_NRMI

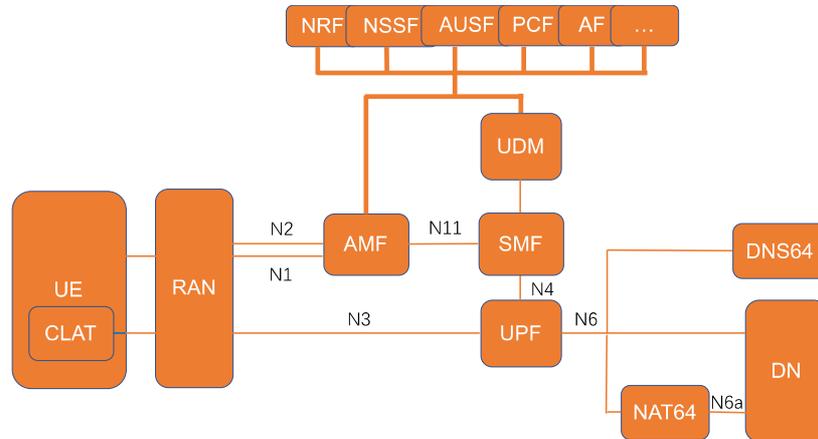


Figure 1: Configuration CF_5G_IPv6only_NRMI

Configuration CF_5G_IPv6only_NRMI is used for a network where users are registered to their home network. The suffix NRMI stands for non-roaming scenario. PDU session establishment procedures of UEs are performed locally in their own home network.

Configuration CF_5G_IPv6only_NRMI shall have CLAT, NAT64 and DNS64 function in the home network. UE shall have CLAT function.

4.2.2 Configuration CF_5G_IPv6only_RMIL

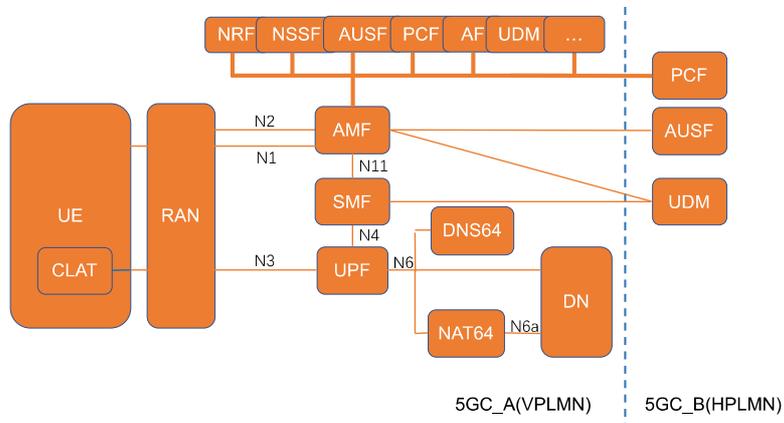


Figure 2: Configuration CF_5G_IPv6only_RMIL

Configuration CF_5G_IPv6only_RMIL describes the roaming scenario with Local Breakout (LBO). UE connects to the visited network 5GC_A. In the case of LBO, the PDU session establishment procedure is as in the case of non-roaming with the difference that the AMF, the SMF, the UPF and the PCF are located in the visited network.

Configuration CF_5G_IPv6only_RMIL shall have CLAT, NAT64 and DNS64 function in the visited network. UE shall have CLAT function.

4.2.3 Configuration CF_5G_IPv6only_RMIH

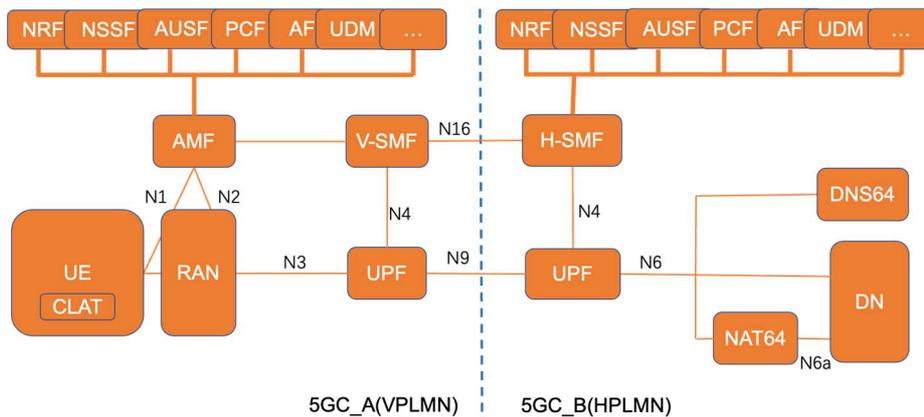


Figure 3: Test configuration CF_5G_IPv6only_RMIH

Configuration CF_5G_IPv6only_RMIH describes the Home-Routed (HR) roaming scenario. UE connects to the visited network 5GC_A. The PDU session is supported by a SMF function under control of the HPLMN, by a SMF function under control of the VPLMN, by at least one UPF under control of the HPLMN and by at least one UPF under control of the VPLMN.

Configuration CF_5G_IPv6only_RMIH shall have NAT64 and DNS64 function in the home network. UE shall have CLAT function.

NOTE: PDU Sessions for Emergency services are never established in Home Routed mode. The local network where UE connects shall have NAT64 and DNS64 function.

4.3 Test infrastructure

4.3.1 Introduction

The present clause covers the list of relevant components used for testing interoperability in 5G. For components that are not present, standard functionality is assumed.

This infrastructure consists 5G system components and 464XLAT+DNS64 architecture to provide IPv6-only connectivity.

NOTE: The components for 464XLAT+DNS64 architecture are denoted with IPv6-only in parentheses. While the 5G components are denoted with 5G or 5GC in parentheses according to the location of the function.

4.3.2 Test component descriptions

4.3.2.1 CLAT (IPv6-only)

The customer-side translator (CLAT) is a translating function that provides connectivity between IPv6 and IPv4, complying with Stateless IP/ICMP Translation Algorithm (SIIT) defined in IETF RFC 7915 [8]. It algorithmically translates 1:1 private IPv4 addresses to global IPv6 addresses according to the algorithm defined in (IETF RFC 6052 [3]), and vice versa.

In the present document, the CLAT function is executed on UEs. the CLAT performs IP routing and forwarding to facilitate packets forwarding through the stateless translation. The CLAT should generate IPv4 addresses in the 192.0.0.0/29 subnet, which IANA has listed reserved for IPv4 Service Continuity Prefix (IETF RFC 7335 [7]).

4.3.2.2 PLAT/NAT64 (IPv6-only)

The provider-side translator (PLAT) is a translating function that provides connectivity between IPv6 and IPv4, which is also called stateful Network Address Protocol Translation (NAT64) function defined in IETF RFC 6146 [4]. The translation is done by translating the packet headers according to the IP/ICMP Translation Algorithm defined in IETF RFC 7915 [8]. The IPv4 addresses of IPv4 hosts are algorithmically translated to and from IPv6 addresses by using the algorithm defined in (IETF RFC 6052 [3]). The IPv6 addresses of IPv6 hosts are translated to and from IPv4 addresses by installing mappings in the normal Network Address Port Translation (NAPT) manner defined in (IETF RFC 3022 [2]). The PLAT function maintains a mapping table to record binding of an IPv6 address and TCP/UDP port to an IPv4 address and TCP/UDP port.

4.3.2.3 DNS64 (IPv6-only)

The Domain Name Service Extensions for Network Address Translation from IPv6 Clients to IPv4 Servers (DNS64) is considered as a key point entity in the present document to provide IPv4 servers address and IPv6 prefix used for translation. DNS64 is a mechanism for synthesizing AAAA Resource Records (RRs) from A RRs. The IPv6 address contained in the synthetic AAAA RR is algorithmically generated from the IPv4 address and the IPv6 prefix assigned to a NAT64 device by using the same algorithm defined in (IETF RFC 6052 [3]).

The DNS64 also provide a method for CLAT to learn the IPv6 prefix used for protocol translation on an access network. The method depends on the existence of a well-known IPv4-only fully qualified domain name "ipv4only.arpa.". The information learned enables nodes to perform local IPv6 address synthesis and to potentially avoid NAT64 on dual-stack and multi-interface deployments (IETF RFC 7050 [6]).

The DNS64 function mainly implements on recurse resolvers.

4.3.2.4 User Equipments (5G)

The test infrastructure shall contain User Equipments (UEs). These are represented by client devices or simulators, capable of performing the 5GC procedures.

The test descriptions are focusing only on the full message exchange details at the observation point at one client device.

4.3.2.5 AMF (5GC)

Access and Mobility Management Functionality (AMF) is the key control-node for the 5G access-network. It is responsible for Registration Management, Connection Management, Reachability Management, and Mobility Management.

UE registration is the fundamental procedures before it creates a PDU session.

4.3.2.6 SMF (5GC)

The Session Management Function (SMF) is a fundamental element of the 5G system. The SMF is primarily responsible for interacting with the decoupled data plane, creating, updating and removing Protocol Data Unit (PDU) sessions and managing session context with the User Plane Function (UPF).

The Test Descriptions are focusing only on the full message exchange details with UE IP address allocation & DNS

IP address allocation. The UE IP address may be received from a UPF or from an external data network.

4.3.2.7 UPF (5GC)

The User Plane Function (UPF) plays the most critical role in data transfer. It is responsible for providing connectivity between the UE and external packet data networks.

The test descriptions are focusing only on allocation of UE IP address/prefix (if supported) in response to SMF request and packet routing & forwarding based on IPv6.

4.3.2.8 UDM (5GC)

The Unified Data Management (UDM) manages data for access authorization, user registration, and data network profiles. Subscriber data is provided to the Session Management Function (SMF), which allocates IP addresses and manages user sessions on the network.

To provide this functionality, the UDM uses subscription data (including authentication data) that may be stored in UDR, in which case a UDM implements the application logic and does not require an internal user data storage and then several different UDMs may serve the same user in different transactions.

4.3.3 Applicable 3GPP Release Number

Considering that the purposes of these tests is to prove base IOP in 5G SA systems from potentially different vendors, the functionality has been limited to common/typical procedures, while exhaustive conformance testing is out of the scope of the present document. The present document is aimed at 5G SA network, Releases refers to 5G SA system implementations should still be able to perform most of the tests without major difficulties.

4.4 Test pre-requisites

5G system provides IPv6 protocol functionality and has a selectable DNN which PDU session type is only IPv6.

4.5 Test description overview

The test descriptions are documented in clauses 5, 6 and 7.

Clause 5 represents test descriptions in the single network (non-roaming) case and clauses 6 and 7 in the roaming case. For each clause, the test descriptions are presented in the following groupings:

- UE IPv6 address allocation;
- DNS/DNS64 address allocation;
- NAT64 prefix discovery;
- Access of Internet IPv4 servers;
- Access of Internet IPv6 servers.

The Test Descriptions present a definitive signaling and procedural flow through the test's execution. As a very high number of test variations may be generated, here only the most common scenarios are approached.

4.6 TD naming convention

TDs are numbered, starting at 01, within each group.

Table 1: TD identifier naming convention scheme

Identifier: <TD>_<group>_<scope>_<nn>			
<td>	= Test Description:	fixed to "TD"	
<group>	= Test Group:	RML - roaming with local breakout	
		RMIH - roaming with home routed	
		NRMI - non-roaming	
<scope>	= subgroup	IPAA	UE IPv6 address allocation
		DNSAA	DNS/DNS64 address allocation
		PRFD	NAT64 prefix discovery
		AC4	Access of Internet IPv4 servers
		AC6	Access of Internet IPv6 servers
<nn>	= sequential number	(01 to 99)	

5 Test Descriptions (Non-roaming)

5.1 General

The Interoperability Test Descriptions (TDs) defined in the following clauses are derived from the Test Purposes (TPs) specified in ETSI TS 103 878-1 [1], where each TD may realize one or more TPs.

Each TD contains three parts:

- 1) The TD itself in tabular format.
- 2) The call flow associated to the TD.
- 3) A textual description of the call flow.

5.2 Test Descriptions

5.2.1 UE IPv6 address allocation

Interoperability Test Description					
Identifier:	TD_NRMI_IPAA_01				
Objective:	To perform that UE can only get IPv6 prefix from 5GC while PDU session is created.				
Summary:	On successful PDU session establishment, the UE should only get IPv6 prefix. CLAT generates an IPv4 address using IPv4 prefix 192.0.0.0/29. The session may be initiated by a UE or a network.				
Configuration:	CF_5G_IPv6only_NRMI				
SUT:	UE, 5GC				
Interfaces:	N1				
References:	ETSI TS 123 501 [9], IETF RFC 6877 [5]				
Pre-test conditions:	<ul style="list-style-type: none"> • UE and 5GC provisioned with selectable DNN configurations for IPv6 PDU session type. • UE registered to the 5GC. • SMF or UPF provisioned with IPv6 address pools. 				
Test Sequence:	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>UE initiated PDU Session Establishment procedure</td> </tr> </tbody> </table>	Step		1	UE initiated PDU Session Establishment procedure
Step					
1	UE initiated PDU Session Establishment procedure				

Interoperability Test Description		
2	Verify that UE registered successfully and received the suitable IPv6 prefix	
3	Verify that IPv6 address assigned to UE is constructed using the IPv6 prefix in the IPv6 address pool.	

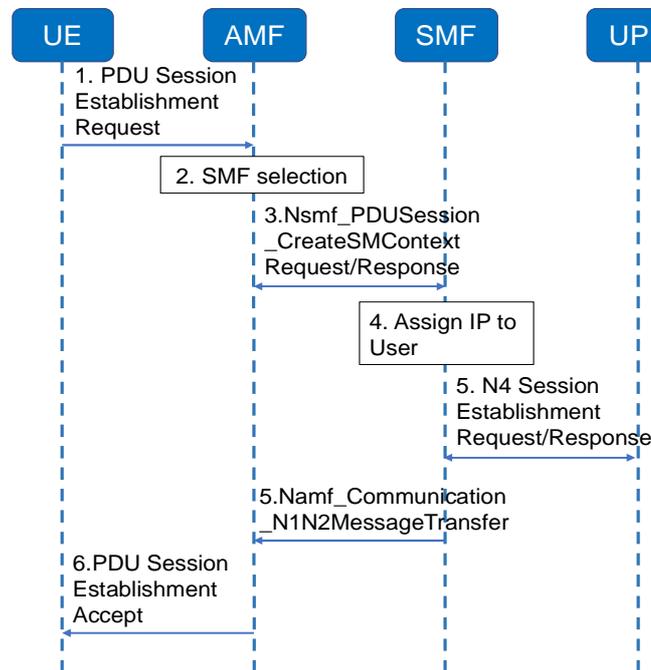


Figure 4: Initial IPv6 address allocation

- 1) The UE sends a PDU Session Establishment Request message to the AMF.
- 2) The AMF perform SMF selection procedure.
- 3) Exchange Nsmf PDU Session CreateSMContext Request/Response message between the AMF and the SMF.
- 4) The SMF assigns IP to the user.
- 5) Exchange N4 Session Establishment Request/Response message between the SMF and the UPF.
- 6) The SMF sends Namf Communication N1N2Message Transfer to the AMF.
- 7) The AMF sends PDU Session Establishment Accept message to the UE.

5.2.2 DNS/DNS64 address allocation

Interoperability Test Description		
Identifier:	TD_NRMI_DNSAA_01	
Objective:	To perform that UE gets DNS64 server address from 5GC while PDU session is created. The session may be initiated by a UE or a network.	
Summary:	On successful PDU session establishment, the UE should get DNS/DNS64 IP address.	
Configuration:	CF_5G_IPv6only_NRMI	
SUT:	UE, 5GC	
Interfaces:	N1	
References:	ETSI TS 123 501 [9], IETF RFC 6877 [5]	
Pre-test conditions:		
	<ul style="list-style-type: none"> • UE and 5GC provisioned with selectable DNN configurations for IPv6 PDU session type. • UE registered to the 5GC. • DNS64 enabled and configured with a particular NAT64 prefix. 	
Test Sequence:		
	Step	
	1	UE initiated PDU Session Establishment procedure

Interoperability Test Description	
2	Verify that UE registered successfully and received the DNS IP address
3	UE sends a query for IPv4-only server's domain name.
4	Verify that the DNS response is AAAA RRs and the IPv6 address is generated from the server' IPv4 address and NAT64 prefix configured in the DNS64.

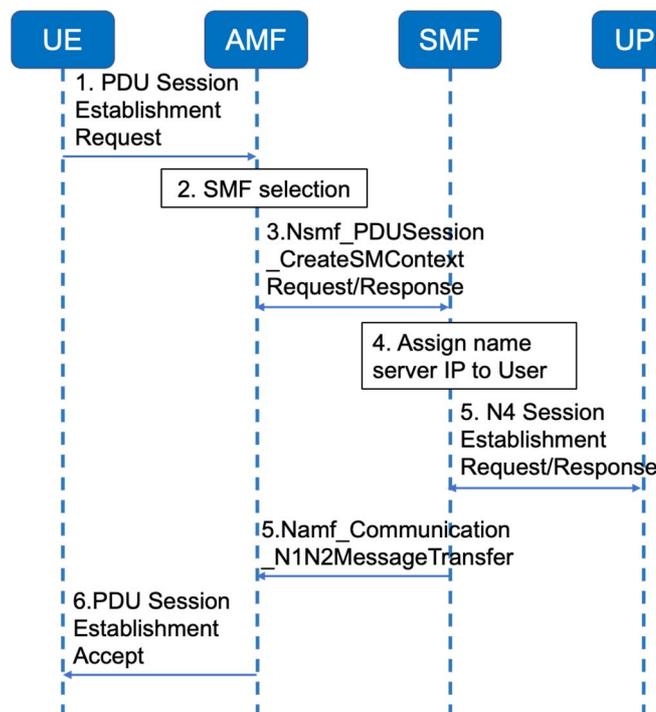


Figure 5: DNS/DNS64 address allocation

- 1) The UE sends a PDU Session Establishment Request message to the AMF.
- 2) The AMF perform SMF selection procedure.
- 3) Exchange Nsmf PDU Session CreateSMContext Request/Response message between the AMF and the SMF.
- 4) The SMF assigns name server IP to the user.
- 5) Exchange N4 Session Establishment Request/Response message between the SMF and the UPF.
- 6) The SMF sends Namf Communication N1N2Message Transfer to the AMF.
- 7) The AMF sends PDU Session Establishment Accept message to the UE.

5.2.3 NAT64 prefix discovery

Interoperability Test Description	
Identifier:	TD_NRMI_PRFD_01
Objective:	To demonstrate UE gets NAT64 prefix from DNS64 server
Summary:	On a successful DNS query, UE gets information about the presence (or absence) of NAT64, and one or more NAT64 prefix used for protocol translation
Configuration:	CF_5G_IPv6only_NRMI
SUT:	UE, 5GC, DNS64
Interfaces:	N6
References:	ETSI TS 123 501 [9], IETF RFC 6877 [5]
Pre-test conditions:	<ul style="list-style-type: none"> • UE and 5GC provisioned with selectable DNN configurations for IPv6 PDU session type. • UE registered to the 5GC.

Interoperability Test Description											
	<ul style="list-style-type: none"> DNS enables DNS64 function, and provisioned AAAA resource records of the well-known IPv4-only name "ipv4only.arpa." 										
Test Sequence:	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>UE triggers a DNS query procedure.</td> </tr> <tr> <td>2</td> <td>Verify that the message sequence is correct.</td> </tr> <tr> <td>3</td> <td>Verify that the message includes AAAA resource records of "ipv4only.arpa."</td> </tr> <tr> <td>4</td> <td>Verify that the message includes IPv6 address constructed using NAT64 prefix.</td> </tr> </tbody> </table>	Step		1	UE triggers a DNS query procedure.	2	Verify that the message sequence is correct.	3	Verify that the message includes AAAA resource records of "ipv4only.arpa."	4	Verify that the message includes IPv6 address constructed using NAT64 prefix.
Step											
1	UE triggers a DNS query procedure.										
2	Verify that the message sequence is correct.										
3	Verify that the message includes AAAA resource records of "ipv4only.arpa."										
4	Verify that the message includes IPv6 address constructed using NAT64 prefix.										

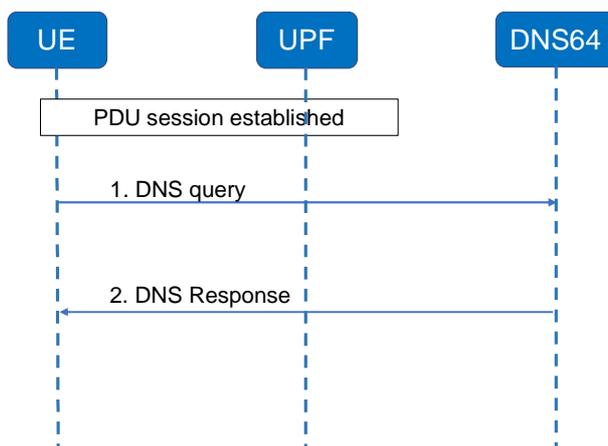


Figure 6: NAT64 prefix discovery

- 1) The UE initiates DNS64 a DNS query.
- 2) DNS64 responds with DNS responses to the UE.

5.2.4 Access of Internet IPv4 servers

Interoperability Test Description											
Identifier:	TD_NRMI_AC4_01										
Objective:	To demonstrate that UE connects to IPv4 HTTP servers in the case of that UE learned the server's IPv6 address with a DNS query for IPv4 server's domain name.										
Summary:	On the successful access to Internet IPv4 servers, UE should get IPv4-embedded IPv6 address through DNS to reach the IPv4 servers.										
Configuration:	CF_5G_IPv6only_NRMI										
SUT:	UE, 5GC										
Interfaces:	N6										
References:	ETSI TS 123 501 [9], IETF RFC 6877 [5]										
Pre-test conditions:	<ul style="list-style-type: none"> UE and 5GC provisioned with selectable DNN configurations for IPv6 PDU session type. UE registered to 5GC. UE established a PDU session. 										
Test Sequence:	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>UE triggers a resource request to a IPv4 HTTP server by the domain name.</td> </tr> <tr> <td>2</td> <td>Verify that the message sequence is correct.</td> </tr> <tr> <td>3</td> <td>Verify that UE received IPv4-embedded IPv6 address.</td> </tr> <tr> <td>4</td> <td>Verify that UE received contents from the IPv4 HTTP server.</td> </tr> </tbody> </table>	Step		1	UE triggers a resource request to a IPv4 HTTP server by the domain name.	2	Verify that the message sequence is correct.	3	Verify that UE received IPv4-embedded IPv6 address.	4	Verify that UE received contents from the IPv4 HTTP server.
Step											
1	UE triggers a resource request to a IPv4 HTTP server by the domain name.										
2	Verify that the message sequence is correct.										
3	Verify that UE received IPv4-embedded IPv6 address.										
4	Verify that UE received contents from the IPv4 HTTP server.										

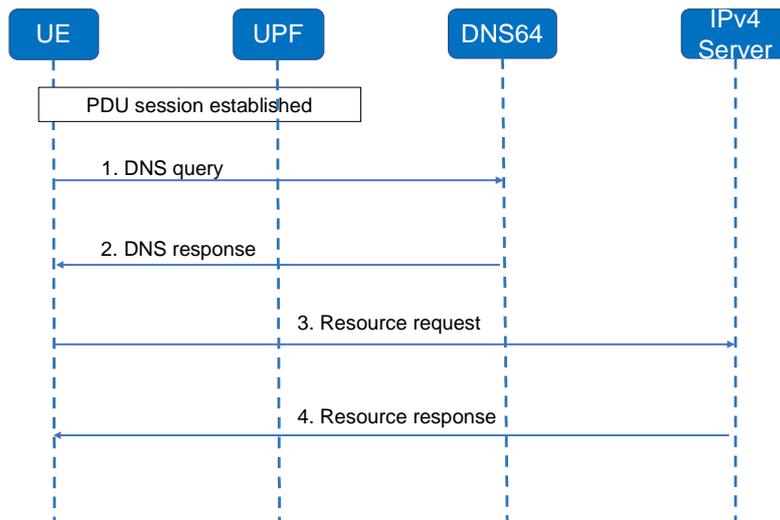


Figure 7: Access of Internet IPv4 servers without CLAT

- 1) UE initiates DNS64 DNS query for domain name "IPv4only.arpa".
- 2) DNS64 responds with DNS response to the UE.
- 3) UE initiates a resource request.
- 4) IPv4 server responds with resource response.

Interoperability Test Description									
Identifier:	TD_NRMI_AC4_02								
Objective:	To demonstrate that UE connects to IPv4 HTTP servers in the case of using CLAT to synthesize IPv6 address rather than DNS64.								
Summary:	On the successful access to Internet IPv4 servers, UE can connect to the IPv4 servers without using DNS64.								
Configuration:	CF_5G_IPv6only_NRMI								
SUT:	UE, 5GC								
Interfaces:	N6								
References:	ETSI TS 123 501 [9], IETF RFC 6877 [5]								
Pre-test conditions:	<ul style="list-style-type: none"> • UE and 5GC provisioned with selectable DNN configurations for IPv6 PDU session type. • UE registered to 5GC. • UE established a PDU session. 								
Test Sequence:	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Verify that UE discovered NAT64 Pref64.</td> </tr> <tr> <td>2</td> <td>UE initiates a resource requirement to a IPv4 HTTP server by IPv4 literal.</td> </tr> <tr> <td>3</td> <td>Verify that UE received contents from the IPv4 HTTP server.</td> </tr> </tbody> </table>	Step		1	Verify that UE discovered NAT64 Pref64.	2	UE initiates a resource requirement to a IPv4 HTTP server by IPv4 literal.	3	Verify that UE received contents from the IPv4 HTTP server.
Step									
1	Verify that UE discovered NAT64 Pref64.								
2	UE initiates a resource requirement to a IPv4 HTTP server by IPv4 literal.								
3	Verify that UE received contents from the IPv4 HTTP server.								

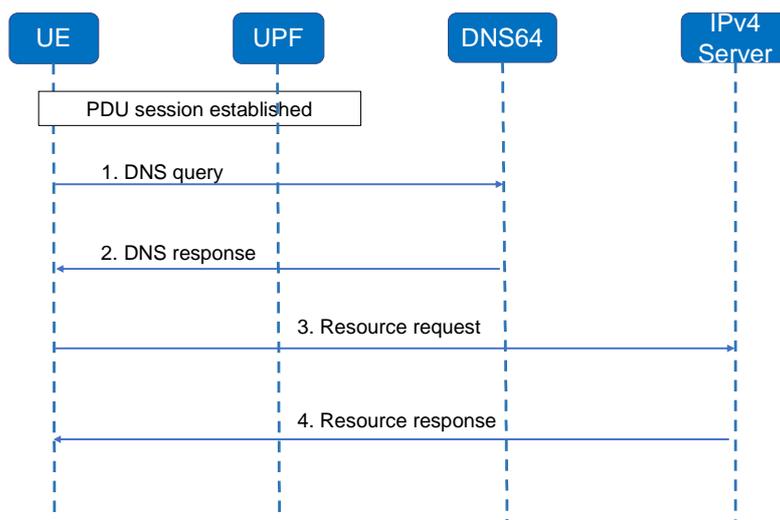


Figure 8: Access of Internet IPv4 servers with CLAT

- 1) UE initiates DNS64 DNS query.
- 2) DNS64 responds with DNS response to the UE.
- 3) UE initiates a resource request.
- 4) IPv4 server responds with resource response.

5.2.5 Access of Internet IPv6 servers

Interoperability Test Description											
Identifier:	TD_NRMI_AC6_01										
Objective:	To demonstrate that UE connects to IPv6 HTTP servers in the case of that UE learned the server's IPv6 address with a DNS query for IPv6 server's domain name.										
Summary:	On the successful access of Internet HTTP IPv6 servers, UE reaches the IPv6 servers and get contents.										
Configuration:	CF_5G_IPv6only_NRMI										
SUT:	UE, 5GC										
Interfaces:	N6										
References:	ETSI TS 123 501 [9], IETF RFC 6877 [5]										
Pre-test conditions:	<ul style="list-style-type: none"> • UDM and UE provisioned with selectable DNN configurations for IPv6 PDN types. • UE established a PDU session. 										
Test Sequence:	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>UE triggers a resource requirement to a IPv6 server.</td> </tr> <tr> <td>2</td> <td>Verify that the message sequence is correct.</td> </tr> <tr> <td>3</td> <td>Verify that UE received IPv6 address of the server.</td> </tr> <tr> <td>4</td> <td>Verify that UE received contents from the IPv6 server.</td> </tr> </tbody> </table>	Step		1	UE triggers a resource requirement to a IPv6 server.	2	Verify that the message sequence is correct.	3	Verify that UE received IPv6 address of the server.	4	Verify that UE received contents from the IPv6 server.
Step											
1	UE triggers a resource requirement to a IPv6 server.										
2	Verify that the message sequence is correct.										
3	Verify that UE received IPv6 address of the server.										
4	Verify that UE received contents from the IPv6 server.										

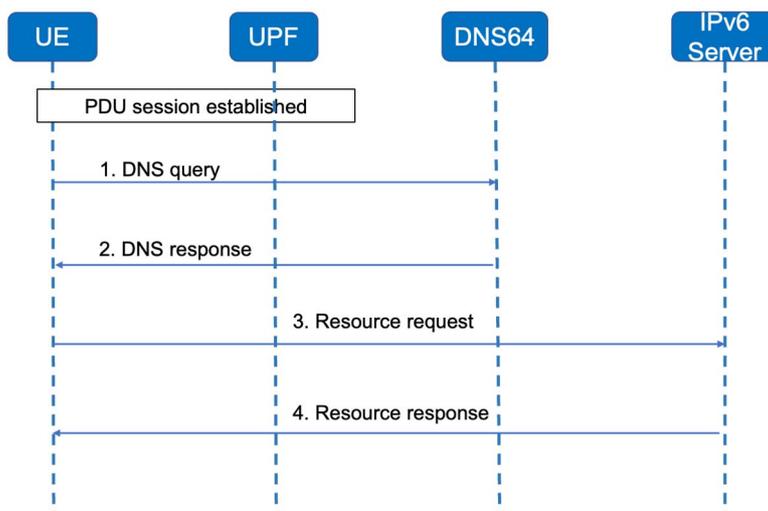


Figure 9: Access of Internet IPv6 servers using domain name

- 1) UE initiates a DNS64 DNS query.
- 2) DNS64 responds with a DNS response to the UE.
- 3) UE initiates a resource request.
- 4) IPv6 HTTP server responds with resource response.

Interoperability Test Description											
Identifier:	TD_NRMI_AC6_02										
Objective:	To demonstrate that UE connects to IPv6 HTTP servers using IPv6 address literal.										
Summary:	On the successful access to Internet IPv6 HTTP servers, UE reaches the IPv6 servers and get contents.										
Configuration:	CF_5G_IPv6only_NRMI										
SUT:	UE										
Interfaces:	N6										
References:	ETSI TS 123 501 [9], IETF RFC 6877 [5]										
Pre-test conditions:	<ul style="list-style-type: none"> • UDM and UE provisioned with selectable DNN configurations for IPv6 PDN types. • UE established a PDU session. 										
Test Sequence:	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>UE triggers a resource requirement to a IPv6 server.</td> </tr> <tr> <td>2</td> <td>Verify that the message sequence is correct.</td> </tr> <tr> <td>3</td> <td>Verify that UE received IPv6 address of the server.</td> </tr> <tr> <td>4</td> <td>Verify that UE received contents from the IPv6 server.</td> </tr> </tbody> </table>	Step		1	UE triggers a resource requirement to a IPv6 server.	2	Verify that the message sequence is correct.	3	Verify that UE received IPv6 address of the server.	4	Verify that UE received contents from the IPv6 server.
Step											
1	UE triggers a resource requirement to a IPv6 server.										
2	Verify that the message sequence is correct.										
3	Verify that UE received IPv6 address of the server.										
4	Verify that UE received contents from the IPv6 server.										

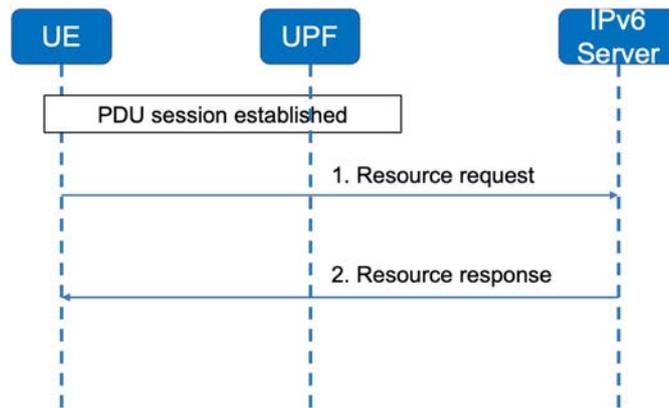


Figure 10: Access of Internet IPv6 servers using IP address

- 1) UE initiates a resource request.
- 2) IPv6 HTTP server responds with resource response.

6 Test Descriptions (Roaming with local breakout)

Since the interfaces are same with test descriptions for non-roaming test configuration. Test descriptions described in clause 5 for CF_5G_IPv6only_NRMI can be reused for configuration CF_5G_IPv6only_RMIL.

7 Test Descriptions (Roaming with home routed)

Since the interfaces are same with test descriptions for non-roaming test configuration. Test descriptions described in clause 5 for CF_5G_IPv6only_NRMI can be reused for configuration CF_5G_IPv6only_RMIIH.

History

Document history		
V1.1.1	May 2025	Publication