

**The NULL Authentication Method in IKEv2 Protocol**  
**draft-smyslov-ipsecme-ikev2-null-auth-02**

Abstract

This document introduces the NULL Authentication Method for the IKEv2 Protocol. This method provides a way to omit peer authentication in the IKEv2. It may be used to preserve anonymity of or in the situations, where no trust relationship exists between the parties.

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## **1. Introduction**

The Internet Key Exchange Protocol version 2 (IKEv2), specified in [[IKEv2](#)], provides a way for two parties to perform authenticated key exchange. Mutual authentication is mandatory in the IKEv2, so that each party must be authenticated by the other. However the authentication methods, used by the peers, need not be the same.

In some situations mutual authentication is undesirable, superfluous or impossible. For example:

- o User wants to get anonymous access to some server. In this situation he/she should be able to authenticate the server, but to leave out his/her own authentication to preserve anonymity. In this case one-way authentication is desirable.
- o User wants to get some simple action from the remote device. Consider garage door opener: it must authenticate user to open the door, but it is not necessary for the user to authenticate the door opener. In this case one-way authentication is sufficient.
- o Two peers without any trust relationship want to get some level of security in their communications. Without trust relationship they cannot prevent active Man-in-the-Middle attacks, but it is still possible to prevent passive eavesdropping with opportunistic encryption. In this case they can use unauthenticated key exchange.

To meet these needs the document introduces the NULL Authentication Method, which is a "dummy" method, that provides no authentication. This allows peer to explicitly indicate to the other side that it is unwilling or unable to certify its identity.

### **1.1. Conventions Used in This Document**

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].



## **2. Using the NULL Authentication Method**

In IKEv2 each peer independently selects the method to authenticate itself to the other side. It means that any of the peers may choose to omit its authentication by using the NULL Authentication Method. If it is not acceptable for the other peer, it MUST return AUTHENTICATION\_FAILED Notification. Note, that when the Initiator uses EAP, the Responder MUST NOT use the NULL Authentication Method (in conformance with the section 2.16 of [[IKEv2](#)]).

The NULL Authentication Method affects how the Authentication and the Identity payloads are formed in the IKE\_AUTH Exchange.

### **2.1. Authentication Payload**

Despite the fact that the NULL Authentication Method provides no authentication, the AUTH Payload must still be present in the IKE\_AUTH Exchange messages and must be properly formed, as it cryptographically links the IKE\_SA\_INIT Exchange messages with the other messages sent over the IKE SA.

With the NULL Authentication Method the content of the AUTH Payload MUST be computed using the syntax for pre-shared secret authentication, described in Section 2.15 of [[IKEv2](#)]. The values SK\_pi and SK\_pr MUST be used as shared secrets for the content of the AUTH Payloads generated by Initiator and Responder respectively. Note, that this is exactly how the content of the two last AUTH Payloads is calculated for non-key generating EAP Method (see [Section 2.16](#) of [[IKEv2](#)] for details). The Auth Method field MUST be set to <TBA by IANA>.

### **2.2. Identity Payload**

The NULL Authentication Method provides no authentication of the party using it. For that reason the Identity Payload content cannot be verified by the peer and MUST be ignored by the IKE. Since peer identity is meaningless in this case, Identification Data SHOULD be omitted from the ID Payload and ID Type SHOULD be set to 0. Implementations supporting the NULL Authentication Method MUST NOT fail if they receive such "empty" ID Payload.

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### **3. Security Considerations**

IKEv2 protocol provides mutual authentication of the peers. If one peer uses the NULL Authentication Method, then this peer cannot be authenticated by the other side, and it makes authentication in IKEv2 to be one-way. If both peers use the NULL Authentication method, key exchange becomes unauthenticated, that makes it subject to the Man-in-the-Middle attack.

The identity of the peer using the NULL Authenticated Method cannot be verified by the other side and, therefore, MUST NOT be used neither for authorization purposes, nor for policy decisions. All peers who use the NULL Authenticated Method should be considered by the other party as "guests" and get the least possible privileges. If the peer uses the NULL Authenticated Method, then the content of its Traffic Selector Payloads must be treated with care. In particular, implementations are advised not to trust blindly that the public IP addresses the peer put into TS Payload are really belong to it. It is RECOMMENDED for security gateways to always assign internal IP addresses to unauthenticated clients as described in Section 2.19 of [[IKEv2](#)].



#### **4. Acknowledgments**

The author would like to thank Paul Wouters, Yaron Sheffer and Tero Kivinen for their reviews and valuable comments.

## **5. IANA Considerations**

This document defines new value in the "IKEv2 Authentication Method" registry:

<TBA>	NULL Authentication Method
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## **6. Normative References**

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
  
- [IKEv2] Kaufman, C., Hoffman, P., Nir, Y., Eronen, P., and T. Kivinen, "Internet Key Exchange Protocol Version 2 (IKEv2)", [draft-kivinen-ipsecme-ikev2-rfc5996bis-04](#) (work in progress), June 2014.

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