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The Unencrypted Form Of Kerberos 5 KRB-CRED Message
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Abstract

The Kerberos 5 KRB-CRED message is used to transfer Kerberos credentials between applications. When used with a secure transport the unencrypted form of the KRB-CRED message may be desirable. This document describes the unencrypted form of the KRB-CRED message.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.
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This Internet-Draft will expire on March 26, 2012.

1. Introduction

There are applications which need to transfer Kerberos credentials between them without having a prior relationship with established Kerberos keys. When transferred over a transport that provides confidentiality and integrity, the unencrypted form of the KRB-CRED message MAY be used. One application employing this method is the

Kerberos attribute transport mechanism described in section 2.8 of the SAML V2.0 Kerberos Attribute Profile *[sstc-saml-attribute-kerberos]*. In the SAML application, the Identity Provider (IdP) somehow obtains a Kerberos service ticket from the Kerberos Key Distribution Center (KDC) when required by the SAML system and transfers the credential to a Service Provider (SP) within an attribute statement. The SP can then use the credential to access a Kerberos protected service.
The Kerberos 5 specification as described in [RFC4120] mentions the non-standard legacy use of unencrypted KRB-CRED with Generic Security Services Application Programming Interface (GSS-API) [RFC1964] by the MIT, Heimdal, and Microsoft Kerberos implementations. This document provides a formal specification of the unencrypted form of the KRB-CRED message to enable its continued use in new applications.

2. Requirements notation

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].

3. The Unencrypted Form Of The KRB-CRED

The unencrypted form of the KRB-CRED contains EncryptedData as defined in Section 5.2.9 [RFC4120]. The encryption type (etype) MUST be specified as 0. The optional key version number (kvno) SHOULD NOT be present and MUST be ignored by the recipient if present. The cipher text (cipher) is a copy of the EncKrbCredPart as defined in Section 5.8.1 [RFC4120] which is in clear text.

4. Kerberos Encryption Type 0 Is Not An Encryption System

The Kerberos Encryption Type 0 is an invalid value [RFC3961]. This means that no [RFC3961] encryption type with value 0 will ever be defined; no encryption or key management operations will use this value. Layers above the encryption layer often transport encryption types as integer values. These layers are free to use a 0 in an encryption type integer as a flag or sentinal value or for other context-specific purposes. For example, section 3 of this specification defines the semantics of a 0 carried in the KRB-CRED message's encryption type field. In the context of the KRB-CRED it is a message specific indicator to be interpreted as the message is not encrypted. This approach was chosen due to existing Kerberos implementations which conform to this specification.

5. Security Considerations

The KRB-CRED message contains sensitive information related to Kerberos credentials being transferred, such as their secret session keys, client and server principal names, and validity period. Possession of this information, along with the ticket itself, would allow an attacker

to impersonate the client named in the ticket. The possibility of modification of the KRB-CRED enables the attacker to substitute the credentials. This can result in the recipient using the credentials of a client which was not intended. As a result, the KRB-CRED message must be carefully safeguarded.
The use of an unencrypted form of the KRB-CRED message MUST only be used with a transport where sender and recipient identities can been established to be known to each other. The transport MUST also provide confidentiality, integrity, and mutual authentication. Examples of transports which MAY be securely used to transport an unencrypted KRB-CRED message would include Transport Layer Security (TLS) [RFC5246] where mutual authentication has been established and those encoded within encrypted and signed SAML Security Assertion Markup Language (SAML) 2.0 *[OASIS.saml-core-2.0-os]* statement.

6. Acknowledgements

The following individuals have contributed to the development of this specification.
Thomas Hardjono, Massachusetts Institute of Technology
Josh Howlett, Individual
Jeffrey Hutzelman, Carnegie Mellon University

7. IANA Considerations

The reference for Kerberos encryption type 0 should be updated to point to this document.

8. References

8.1. Normative References

[RFC1964]	Linn, J., "The Kerberos Version 5 GSS-API Mechanism", RFC 1964, June 1996.
[RFC2119]	Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
[RFC4120]	Neuman, C., Yu, T., Hartman, S. and K. Raeburn, "The Kerberos Network Authentication Service (V5)", RFC 4120, July 2005.
[RFC5246]	Dierks, T. and E. Rescorla, "The Transport Layer Security (TLS) Protocol Version 1.2", RFC 5246, August 2008.
[OASIS.saml-core-2.0-os]	Cantor, S., Kemp, J., Philpott, R. and E. Maler, "Assertions and Protocol for the OASIS Security Assertion Markup Language (SAML) V2.0", OASIS Standard saml-core-2.0-os, March 2005.

8.2. Informative References

[sstc-saml-attribute-kerberos]	Howlett, J and T Hardjono, "SAML V2.0 Kerberos Attribute Profile Version 1.0, OASIS Security Services Draft, sstc-saml-attribute-kerberos.odt (work in progress)", December 2010.
[RFC3961]	Raeburn, K., "Encryption and Checksum Specifications for Kerberos 5", RFC 3961, February 2005.

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