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Container Authenticated by Multiple MACs
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Abstract

Abstract: This document proposes a Kerberos Authorization Data container that supersedes AD-KDC-ISSUED. It allows for multiple MACs or signatures on the contained Authorization Data elements.

Status of this Memo

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1. Introduction

This draft proposes a Authorization Data container for Kerberos that identifies a base set of MAC and other elements necessary to authenticate the authorization data being carried in such a way that not only the KDC but also services can independently verify that the data has been authenticated by the KDC and has not been tampered with.

2. Requirements Language

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 [RFC 2119](#) [[RFC2119](#)].

3. Validation

Authorization data is highly sensitive and must be validated to insure no tampering has occurred.

In order to validate any information the receiving application server needs to be able to cryptographically verify the data. This is done by introducing a new AuthorizationData element called AD-CAMMAC that contains enough information to bind the contents to a principal in a way that a receiving application server can verify autonomously without further contact with the KDC.

The following information is needed:

- o The KDC MAC.
- o The Service MAC.
- o Optional Trusted Service Key MAC.

The KDC MAC is required to allow the KDC to validate the data without requiring to recompute the contents at every TGS request.

The SVC MAC is required so that the Service can verify that the authorization data has been validated by the KDC.

The Trusted Service MAC is useful to verify the authenticity of the contents on the same host, when the data is received by a less trusted service and passed to a more trusted service on the same host without the need for additional roundtrips to the KDC.

The ad-type for AD-CAMMAC is (TBD).

4. Encoding

The Kerberos protocol is defined in [[RFC4120](#)] using Abstract Syntax Notation One (ASN.1) [X680]. As such, this specification also uses the ASN.1 syntax for specifying both the abstract layout of the AD-CAMMAC attributes, as well as its encoding.

4.1. AD-CAMMAC

```
AD-CAMMAC ::= SEQUENCE {  
    elements      [0] AuthorizationData,  
    kdc-verifier   [1] Verifier-MAC,  
    svc-verifier   [2] Verifier-MAC OPTIONAL,  
    other-verifiers [3] SEQUENCE OF Verifier  
}
```

```
Verifier ::= CHOICE {  
    mac Verifier-MAC  
}
```

```
Verifier-MAC ::= SEQUENCE {  
    identifier [0] PrincipalName OPTIONAL,  
    kvno       [1] UInt32,  
    enctype    [2] Int32,  
    mac        [3] Checksum  
}
```

elements

A sequence of authorization data elements issued by the KDC.

kdc-verifier

A container that includes a cryptographic checksum computed over the encoding of the elements field, keyed with the krbtgt key. Checksum type TBD.

svc-verifier

A container that includes a cryptographic checksum computed over the encoding of the elements field, keyed with the service long term key. This field is marked OPTIONAL and can be omitted when the CAMMAC is attached to a local TGT. It MUST be present in all other cases, including cross-realm TGTs. Checksum type TBD.

other-verifiers

A container including a principal name and a cryptographic checksum computed over the encoding of the elements field, keyed with the long term key of the principal name specified in the identifier field. The PrincipalName MUST be present and a valid principal in the REALM for additional verifiers. KDCs MAY add one or more 'trusted service' verifiers. Unless otherwise explicitly administratively configured, the 'trusted service' SHOULD be found by substituting the service identifier component of the principal name of the svc-verifier with 'host'. Checksum type TBD.

5. Assigned numbers

TBD

6. IANA Considerations

TBD.

7. Security Considerations

Although generally authorization data are conveyed within a ticket and are thereby protected using the existing encryption methods on the ticket, some authorization data requires the additional protection provided by the CAMMAC.

8. Acknowledgements

TBD.

9. References

9.1. Normative References

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- [RFC4120] Neuman, C., Yu, T., Hartman, S., and K. Raeburn, "The Kerberos Network Authentication Service (V5)", [RFC 4120](#), July 2005.

9.2. Informative References

- [MIT-Athena]
Steiner, J., Neuman, B., and J. Schiller, "Kerberos: An Authentication Service for Open Network Systems. In Proceedings of the Winter 1988 Usenix Conference. February.", 1988.
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- [X.690] ISO, "ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER) - ITU-T Recommendation X.690 (ISO/IEC International Standard 8825-1:1998)", 1997.

[Appendix A](#). Additional Stuff

This becomes an Appendix.

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