HOKEY 3-Party Key Distribution
(draft-ietf-hokey-key-mgm-01.txt)

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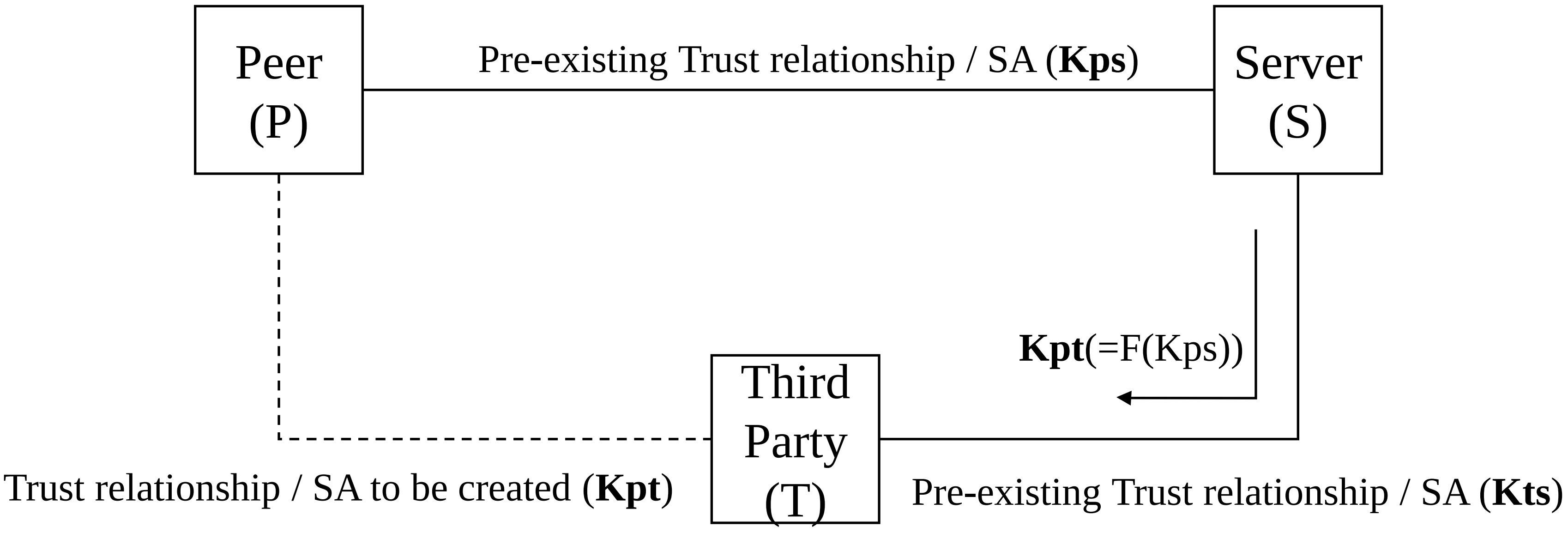
Status

- Submitted -01 in November
- 14 issues are closed
- 2 issues are still open

Key Distribution Model


Peer
(P)
Pre-existing Trust relationship / SA (**Kps**)
Server
(S)
Kpt(=F(Kps))
Third
Party
(T)
Trust relationship / SA to be created (**Kpt**)
Pre-existing Trust relationship / SA (**Kts**)

Kpt is used for dynamically establishing a trust relationship / SA between P and T

Key Distribution Exchange

<table>
<tr><th>Message Name (Parameters)</th><th>P</th><th colspan="2">T</th><th>S</th></tr>
<tr><td>**KDE0 (TID,SID,DID)**
(TID, SID, DID) = (Third Party ID, Server ID, Domain ID)</td><td colspan="2">←</td><td colspan="2"></td></tr>
<tr><td>**KDE1 (PRT)**
PRT(Peer Request Token) =
Int[KIps,(PID, TID, SID, DID, FVp, KT, KN_KIps)]</td><td colspan="2">→</td><td colspan="2"></td></tr>
<tr><td>**KDE2 (TRT)**
TRT(Third Party Request Token) =
Int[KIts, (PID, TID), PRT]</td><td colspan="2"></td><td colspan="2">→</td></tr>
<tr><td>**KDE3 (TOK)**
TOK(Key Token) =
{PID, TID, KN_Kpt, KL_Kpt, Kpt, SAT}KCts</td><td colspan="2"></td><td colspan="2">←</td></tr>
<tr><td>**KDE4 (SAT)**
SAT(Server Authorization Token) =
Int[KIps,(PID, TID, SID, DID, FVp+1, KN_Kpt, KL_Kpt, KN_KIps)]</td><td colspan="2">←</td><td colspan="2"></td></tr>
</table>

Int [K, X] : X || MIC(K,X)
{X}K: X encrypted with K

FVp: Freshness Value generated by P
KT: Key Type
KN_X : Key Name for key X
KL_X: Key Lifetime for key X

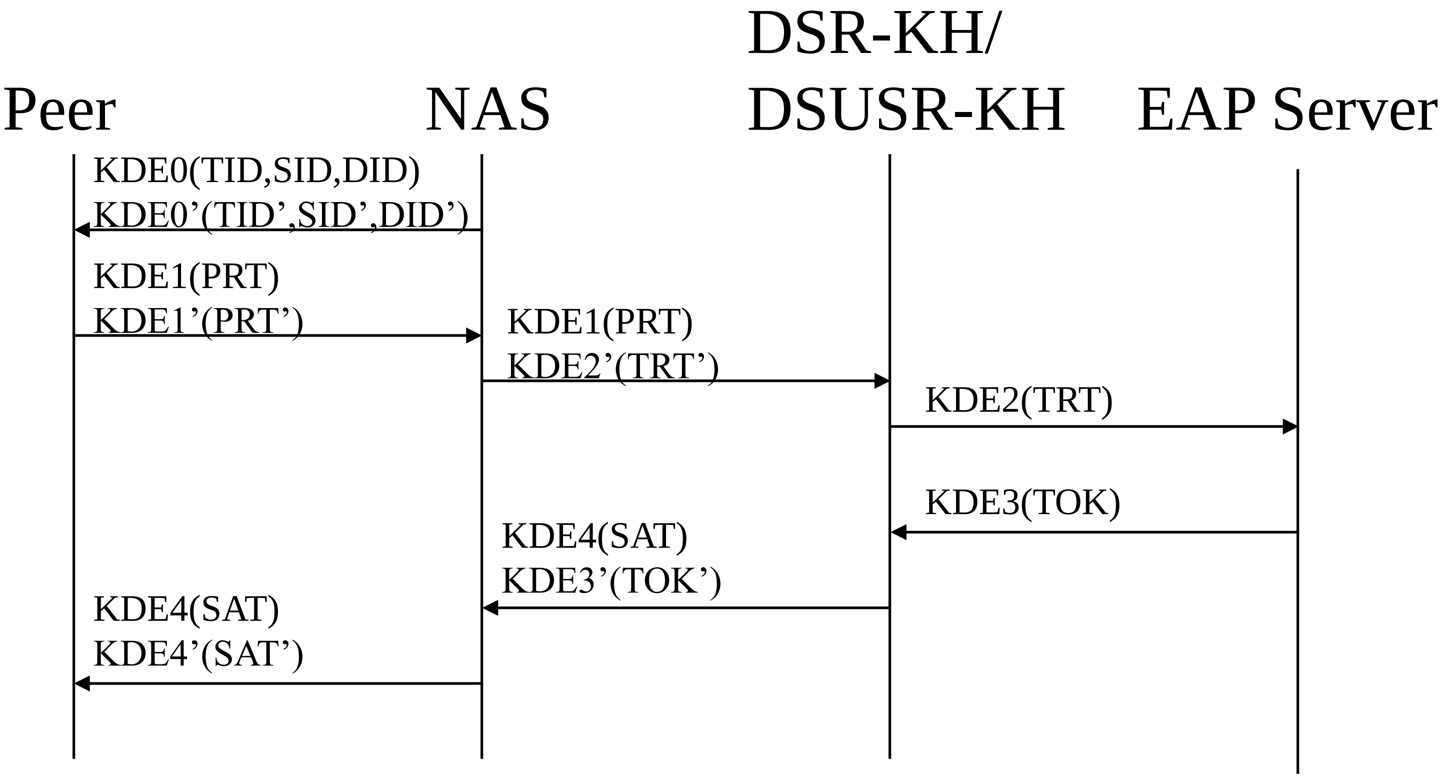
KIts (or IK): Key Integrity Key
KCts (or CK): Key Encryption Key
(IK and CK are derived from
EMSK, USRK or DSUSRK
depending on usage scenarios)

Usage Scenarios

Scenario #	Server	Third Party	Transported Key
1	EAP Server	NAS	rMSK
2	EAP Server	USR-KH	USRK
3	EAP Server	DSR-KH	DSRK
4	DSR-KH	DSUSR-KH	DSUSRK
5	USR-KH	NAS	rMSK
6	DSUSR-KH	NAS	rMSK
7	USR-KH	USDSR-KH(*)	USDSRK

Note1: EAP Peer is always Client of 3-party key distribution
Note2: USDSR-KH is key holder for a domain-specific root key defined
by each usage (and hence details are not defined in any HOKEY document

Combined KDE



Closed Issues (1/2)

- Issue 7 (replay attacks/nonce Np): -01 uses FV (freshness value) which allows time stamp or nonce. In the case of nonce, the draft has a warning that an additional mechanism may be required to assure freshness
- Issue 8 (server id/domain id), -01 uses both server id and domain id to be more flexible.
- Issue 9 (carrying key names), -01 still carries key names to identity the latest key from older ones between a given pair of entities where each entity is still identified with PID, SID or TID.
- Issue 10 (carrying key types), -01 has now key type (KT) in message 1, requiring that the peer specifies the key type
- Issue 11 (carrying DTID and DUID), -01 carries only TID for the third-party identity instead of DTID and DUID
- Issue 12 (formatting of msg2, composition attack), the second Int[] is now carried inside the first Int[].
- Issue 13 (key length in message 3/4), key length is now integral part of key variable. Note KL_X now represents a key lifetime of key X instead of a key length of key X

Closed Issues (2/2)

- Issue 14 (key name generation), -01 follows hokey-emsk draft for key name generation
- Issue 24 (editorial changes): Done
- Issue 25 (update figure 1 to match EMSK doc), Fig 1 has been updated to be consistent with hokey-emsk doc
- Issue 26 (references to HOKEY/HRK/etc), HRK and DSHRK are removed
- Issue 29 (hierarchy depth, DSUSRK children): -01 has only one usage for a child key of DSUSRK, that is ERX usage for rMSK derived from DSUSRK
- Issue 30 (terminology for DSRK child keys): KX and KY are removed
- Issue 31 (remove section 5.1), Section 5.1 is removed (except for CK and IK)

Open Issue: Issue 27 (Protocol Format)

- Formal protocol format specification will be added in the next revision
- But the format should be generic enough to be carried in various transport protocols

Open Issue: Issue 28

- -01 still mandate key encryption between server and 3rd party. Instead, the following note has been added in Security Considerations section:

  > "EDITOR'S NOTE: For a key distribution mechanism that works with indirect trust relationship, a Kerberos-like key distribution protocol that supports "inter-realm" keys would be needed."

- Should we allow hop-by-hop encryption?