Inter-KDC protocol for improved Kerberos cross-realm operations

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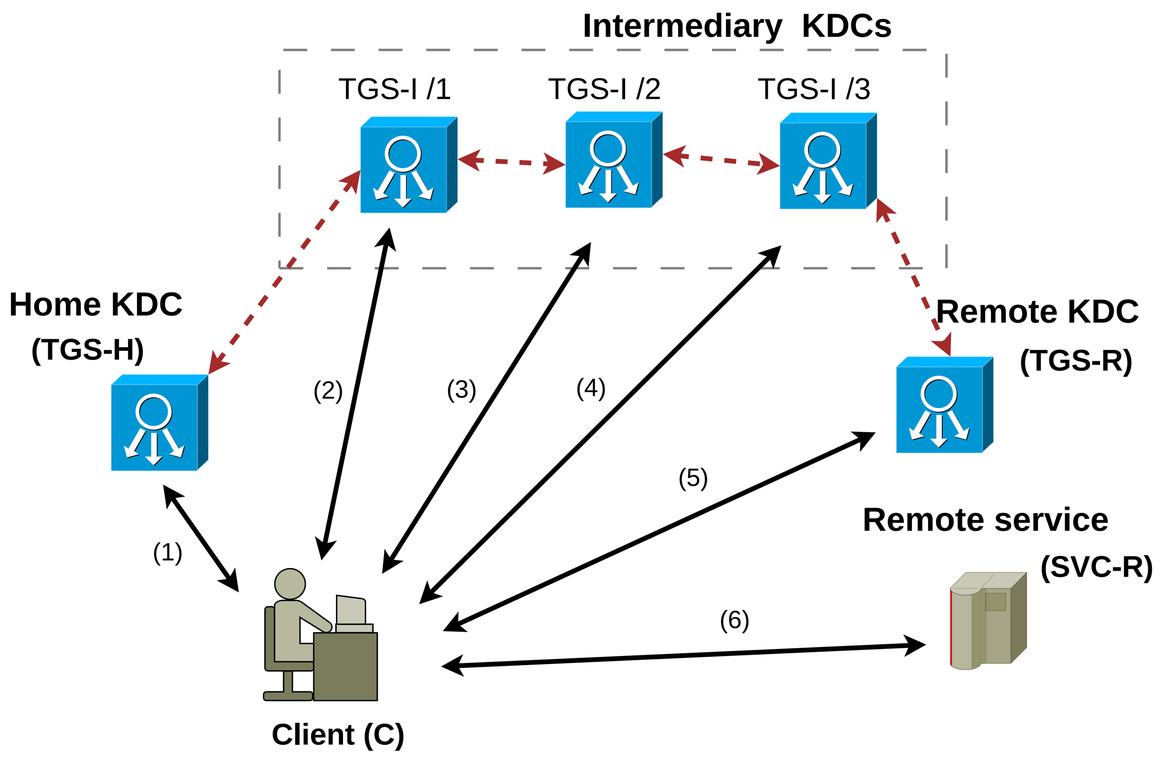
Issues in Kerberos cross-realm operations



Definitions

Key Distribution Center (KDC) :

* Shares keys with clients, services, other KDCs
* Has two components : AS , TGS

Ticket Granting Ticket (TGT) :

* Obtained by clients from the AS
* Allows clients to communicate with TGS

Service Ticket (ST) :

* Obtained by clients (who have a TGT) from the TGS
* Allows clients to communicate with an application svc

Issues

Performance

Client involved in too many exchanges

-> Not adapted for small devices

Reliability

If any Intermediary KDC is down

-> Client can't authenticate

Security

If any Intermediary KDC is corrupted

-> Client/server communication unsafe

Operations

1 : C -> TGS-H : Give me TGT for TGS-R
TGS-H -> C : TGT for TGS-I/1

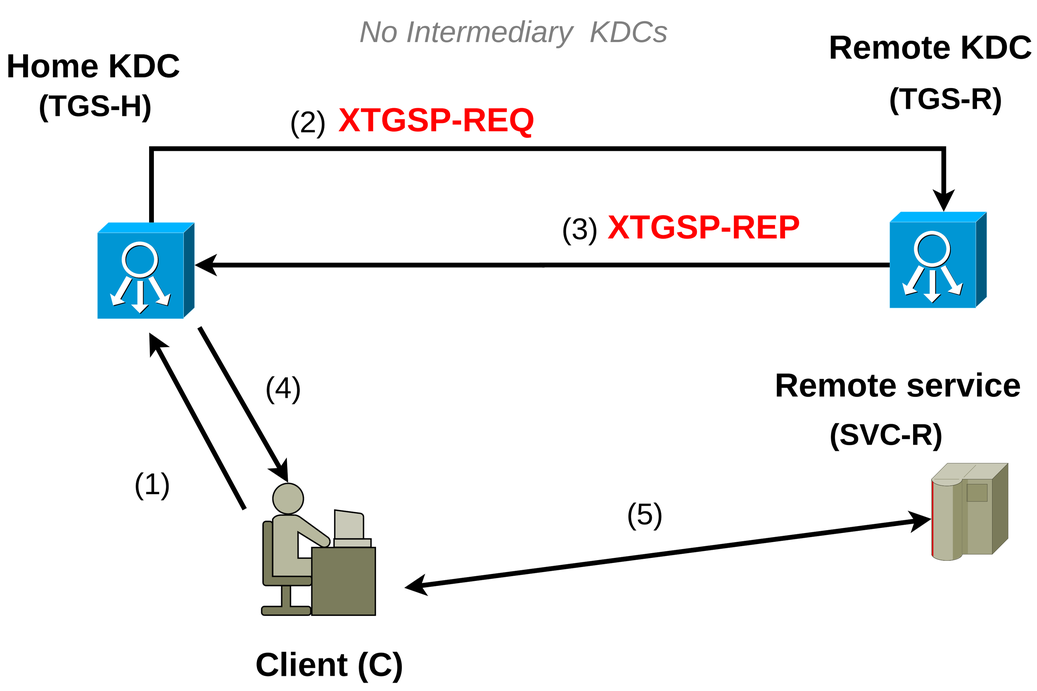
2,3 : C -> TGS-I/n : Give me TGT for TGS-R
TGS-I/n -> C : TGT for TGS-I/n+1

4 : C -> TGS-I/3 : Give me TGT for TGS-R
TGS-I/3 -> C : TGT for TGS-R

5 : C -> TGS-R : Give me ST for SVC-R
TGS-R -> C : ST for SVC-R

6 : C authenticates with SVC-R

Our approach : XTGSP, the inter-TGS Kerberos cross-realm protocol



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Concept

- **No Intermediary KDCs**
- **Public-Key cryptography to establish Inter-realm trust**
- **Client requests an ST for SVC-R from its home KDC**
- **Home KDC comunicates with remote KDC to build a ST for the client**

Operations

1 : C -> TGS-H : Give me ST for SVC-R

2 : TGS-H -> TGS-R : Give me a ST for my client C to access your service SVC-R.

3 : TGS-R -> TGS-H : Here is a ST

4 : C -> TGS-H : ST for SVC-R

5 : C authenticates with SVC-R

Advantages

Cross-realm processing delegated to KDCs → **Less load on small devices**

No intermediary KDCs → **Better reliability, better security**

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