Cross-realm issues could be a charter item ?

Shoichi Sakane

Shouichi.Sakane@jp.yokogawa.com

The 68th IETF meeting

Purpose of this presentation

- Introduction of current activities
- (Introduction of some of current approaches.)
- (Discussion about problems.)
- Approval of adding it into the charter

Current activities

- 4 documents AFAIK

1. draft-sakane-krb-cross-problem-statement-01.txt
2. draft-kamada-krb-client-friendly-cross-01.txt
3. draft-ietf-cat-kerberos-pk-cross-08.txt
4. draft-zrelli-krb-xtgsp01.txt

Problem statement

- draft-sakane-krb-cross-problem-statement-01.txt
- Introduced an actual environment.
- Listed requirements and constraints.
- Specified issues if krb is employed.

Issues that are defined

1. Client's Performance
2. Unreliability of authentication
3. No PFS
4. Scalability of the direct trust model
5. Exposure to DoS attacks
6. Applicability to roaming scenario

Approaches

- Client friendly model
  - Draft-kamada-krb-client-friendly-cross-01.txt
  - Proposed a model with tow modes.
- XTGSP
  - Draft-zrelli-krb-xtgsp-01.txt
  - Proposed a solution with new extensions.
- PKCROSS
  - Draft-ietf-cat-kerberos-pk-cross-08.txt (expired)
  - Proposed a protocol to establish inter-realm key.

Steps to go

1. Finding out issues
2. Defining problems
3. Adding it into the charter
4. (Repeating 1 and 2)
5. Evaluating approaches
6. Proposing protocols

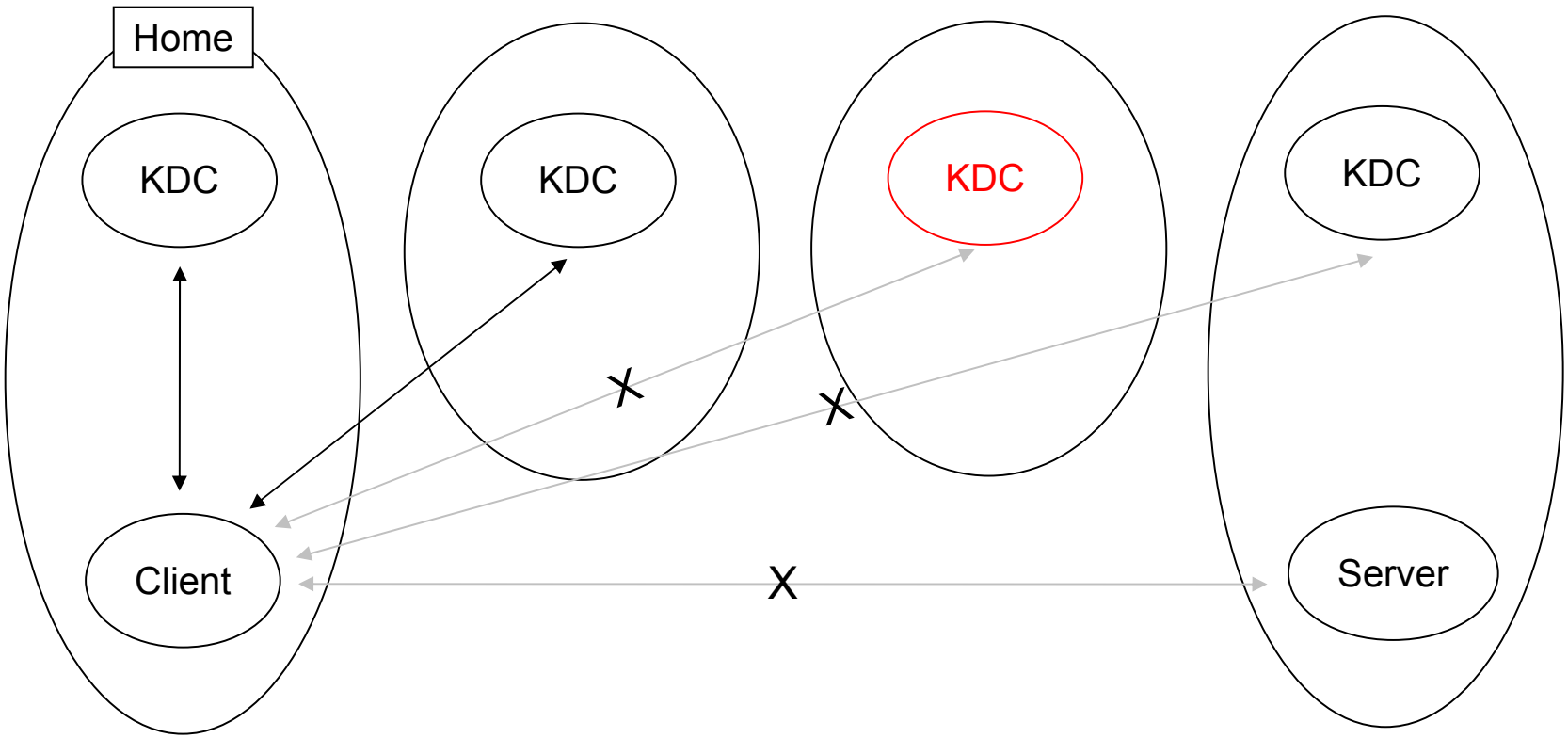
Question

- **Could this item be a charter item ?**
- **Do we need more discussion before adding it ?**
- **Could the problem statement be a working group document ?**
- **[off topic] Are you interested in the approaches ?**

End of presentaion

Reliability of chain

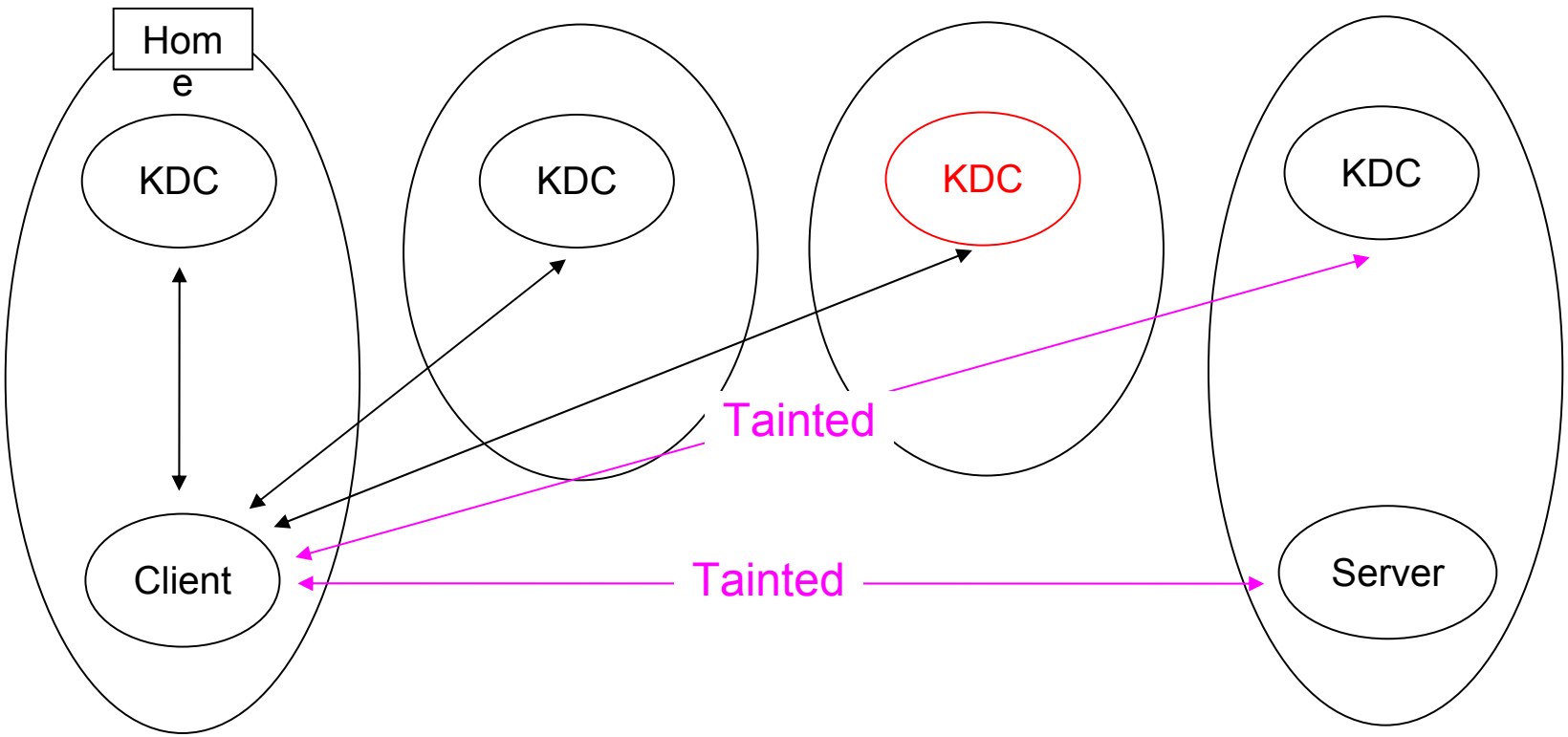
When an intermediary KDC downs,
the authentication will fail.



No PFS in indirect trust model

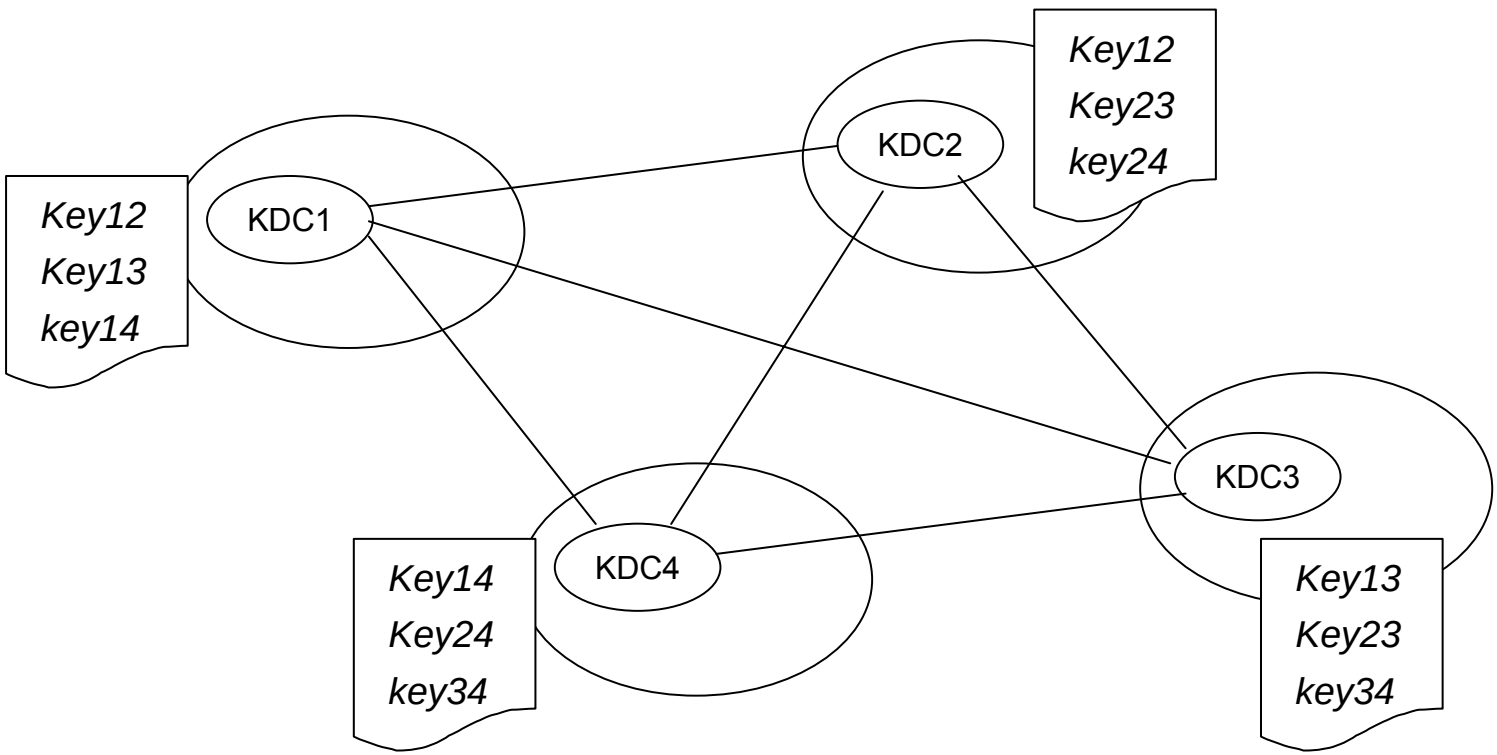
Intermediary KDCs can learn session keys.

ref. "Specifying Kerberos 5 Cross-Realm Authentication", Fifth Workshop on Issues in the Theory of Security, Jan 2005.



Scalability of direct trust model

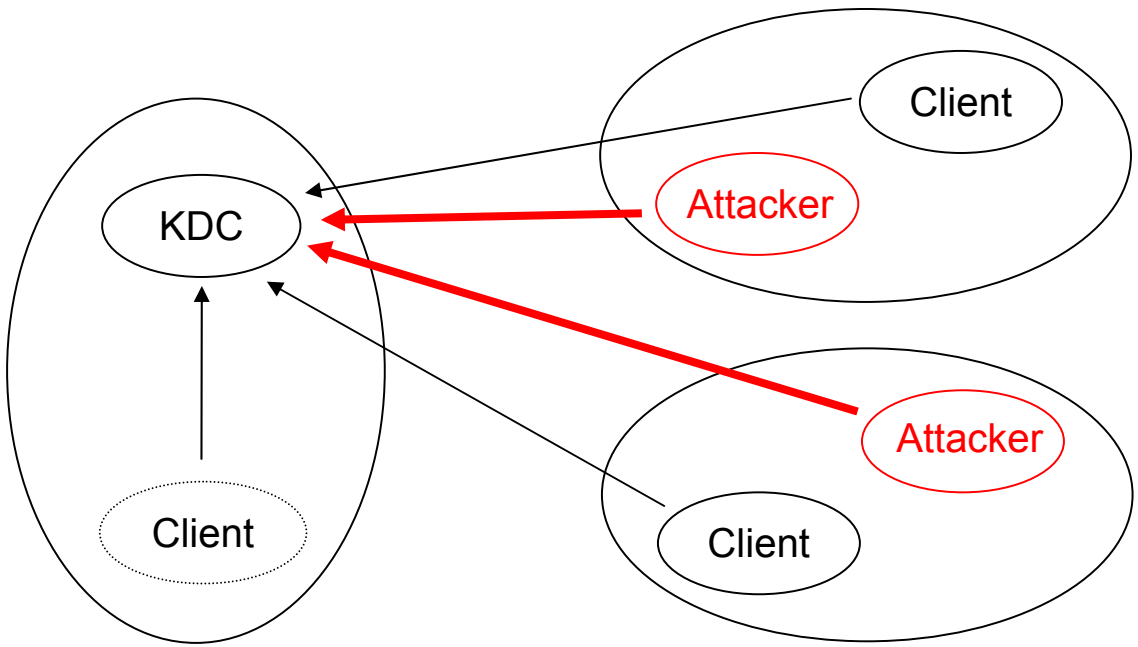
- When realms make a direct authentication path,they need to maintain each inter-realm key.



Exposure to DoS attack

Not easy to set up filters to protect KDC.

- KDC handles TGS exchanges with remote clients from different realms.



Client's performance

Client centralized exchanges causes unacceptable delay.

- Client must perform TGS exchange with each KDC of the trust path.

→Not scalable if number of realms increases especially for small/embedded devices.

Processing time of Kerberos on embedded devices

measured by Yokogawa Electric Corporation 04 through 06

CPU	DS5250 (8051 arch., 8-bit, 22MHz, w/ DES H/W)	H8 (16-bit, 20MHz) + Crypt H/W (AES, 3DES, SHA1, MD5)			
Krb lib	MIT-1.2.4	MIT-1.2.4		Original	
Crypt H/W	Enable	Enable	Disable	Enable	Disable
TGT	4650ms	74ms	106ms	26ms	74ms
TGS	4579ms	195ms	294ms	49ms	178ms

Including waiting time

Excluding waiting time

Applicability to roaming scenario

Roaming users can not access to home KDC from the visited realmdue to chiken-and-egg problem.

- Maybe due to the policy of the realms.