NFSv4 ID Mapping

Rick Mesta
Connectathon 2005
Feb 28 2005

Topics

- NFS Identifiers; then, now, ...
- Multi-domain challenges
- Case study: Sun's WAN
- Solaris' approach: DNS TXT RR
- NFS4 Domain selection in Solaris
- IETF Proposal(s)

NFS Identifiers: then, now...

- ## Past:
  - v2/v3 == 32 bit otw attrs

- ## Present:
  - RFC 3530: `[user|group]@domain`

- ## Future:
  - General purpose string/id mapping service

Multi-domain challenges

- ## The Good:
  - file/dir ownership from RPC/krb info (`CREATE`)

- ## The Bad:
  - Unix OS's don't support domain qualified id's
  - `SETATTR` failures on mismatched domains
  - "`nobody`" reporting storms on client
    - ripple-effect problems on apps that `stat(2)` files to determine ownership (ie. gnome)

4

Case Study: Sun's WAN

- One corporate level domain "`sun.com`"
- Constitutes multiple-geo's:
  - Typically, one sub-DNS domain per geo
  - Geo sub-DNS domain has 1[+] NIS domain(s)
  - Lab systems typically configured NIS-only

Sun WAN: Typical NFS4 traffic
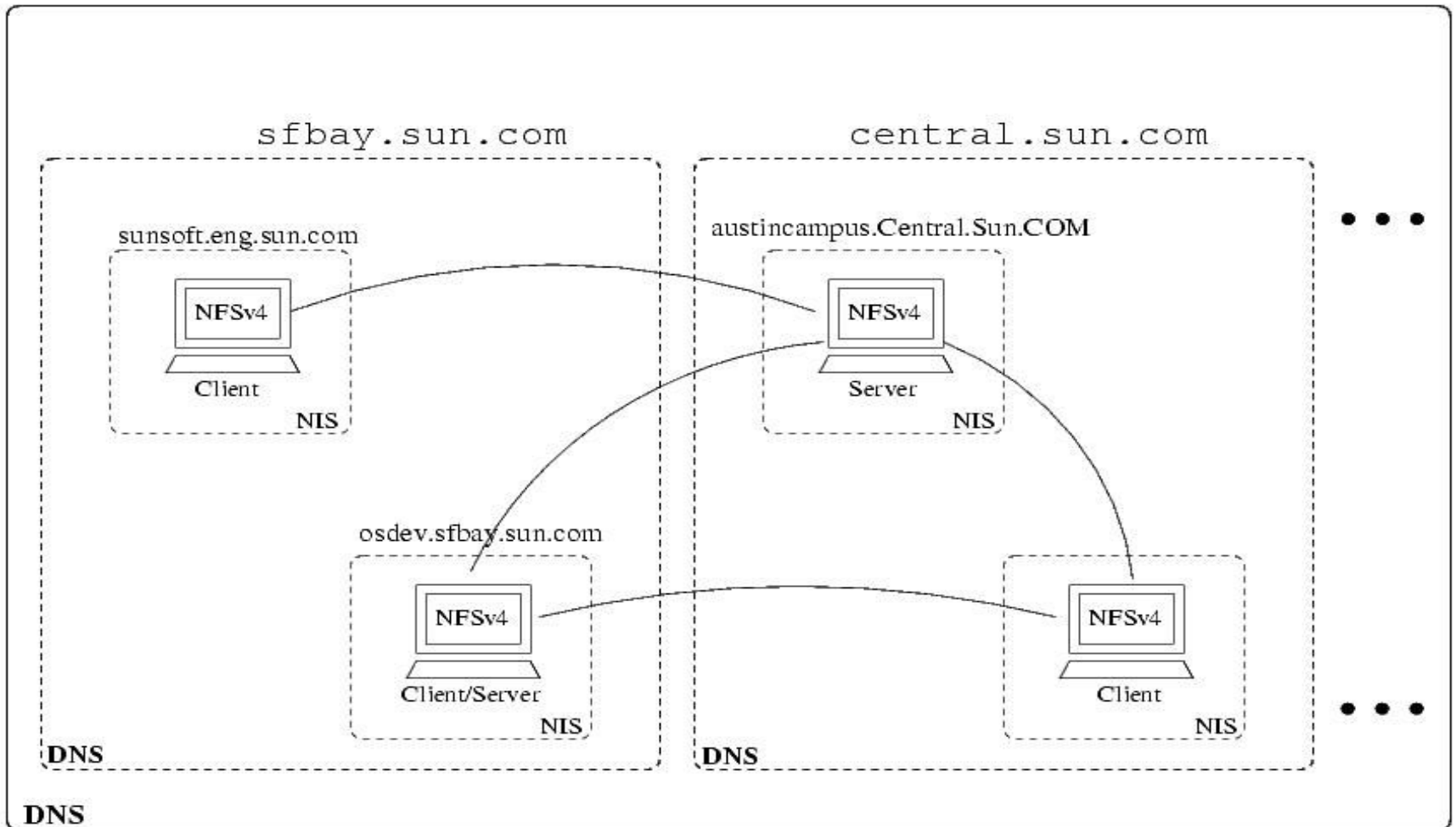
Case Study: Sun's WAN cont'd

- Key Points
  - Typical NFSv4 access is across domain boundaries
  - Client/Server domain mismatches cause:
    - "`nobody`" reporting storms (regardless of id space)
    - `owner`/`owner_group` `SETATTR` failures
  - Solaris does not natively handle domain qualified id's

Solaris impl: DNS TXT RR

- Pros
  - DNS is ubiquitous
  - High probability of use for hostname resolution
  - Can leverage as NFS4 domain distribution svc
- Cons
  - Additional sysadmin intervention
  - TXT RR's are problematic due to sub-typing
  - Not <u>the</u> final/gen purpose id/string mapping svc

8

Domain Selection in Solaris

- `/etc/resolv.conf`
  - Does DNS TXT RR exist ?
    - `TRY_AGAIN`: Fire requery thread; Move on...
    - `NETDB_SUCCESS`: Yes; Done !
    - `NO_DATA`: No! Move on...
  - Use DNS domain itself
- `domainname(1m)`
- `/etc/default/nfs` (`NFSMAPID_DOMAIN`)

9

IETF Proposal(s)

`http://www.ietf.org/internet-drafts/draft-mesta-nfsv4-domain-01.txt`

- Motivation
  - Unix OS's don't handle domain qualified id's (yet)
  - Multi-domain NFSv4 deployment is problematic
  - Mismatched domains cause `nobody` storms
  - DNS likely to be used for hostname resolution

- Interim-Solution
  - TXT RR's are susceptible to sub-typing
  - DNS NFS4 specific RR I-D to be submitted
  - Stop gap measure until gen purpose string/id mapping svc can be adopted

Summary

- Multi-domain NFS4 envs are problematic
- No common way to configure domain (as per RFC 3530)
- DNS is likely to be used
  - leverage it
  - can mitigate problem until general string/id mapping svc available
  - TXT RR's not an elegant solution; NFS4 specific RR I-D to be submitted

NFSv4 ID Mapping

rick.mesta@sun.com