FedFS Standards Update

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FedFS Update

- Standards progress
- Linux FedFS implementation update
- Next steps
FedFS In A Nutshell

Legacy: /net with automounter

• Good:
  • Users trigger an NFS mount simply by changing to a particular directory
  • Very little client provisioning is required

• Bad:
  • NFS server hostname and export path are exposed to applications and users
  • All mounted shares are namespace leaves
FedFS In A Nutshell

Microsoft DFS

- Clients mount one share that contains referrals to interesting public shares in a realm
- Referral target information stored centrally in Active Directory
- Referred-to shares are namespace leaves
  - Relaxed in recent versions?
FedFS In A Nutshell

FedFS

- Like /net, root of namespace is mounted by simply changing to a directory under /nfs4

- Like DFS, namespace root contains referrals to other shares

- Following a referral triggers automatic mount operations

- Referral target information can be stored locally on fileservers, or centrally in LDAP
FedFS In A Nutshell

Advantages of FedFS

• No client provisioning

• Referrals can exist in any share, so mounted shares are not necessarily leaves

• No data location information is exposed in FedFS pathnames

• FedFS namespace is identical on all clients
FedFS In A Nutshell

FedFS in operation

- DNS SRV contains hostname of fileserver that shares domain root directory via a well-known export name

- NFS clients mount domain root directories under /nfs4

- Fileservers perform LDAP queries via the *NSDB protocol* to retrieve referral target information

- The *ADMIN protocol* creates referrals remotely or provisions LDAP server information on fileservers
FedFS Standards Progress

Standards documents

- FedFS requirements
- DNS SRV
  - Domain root discovery
- NSDB Protocol
  - LDAP-based location database
- ADMIN Protocol
  - Remote junction management
  - NSDB certificate distribution
FedFS Standards Progress
Updates to NSDB protocol

- fedfsNceDN replaces fedfsNcePrefix
- Redefined NFS URL replaces FslHost, FslPort and NfsPath
- NsdbName and NsdbPort removed
- TTL moved from FSL to FSN
- Use conventional UUID types
- NfsMajorVer and NfsMinorVer attributes removed
FedFS Standards Progress
Changes during IESG review

• Correct use of RFC 2119 qualifiers

• Simplified ABNF for fedfsAnnotation attribute

• Glossary clean-up

• FedFS OID registry closed on creation
FedFS Standards Progress
Authorship changes during IESG review

• Daniel Ellard moved from author list to Acknowledgments section
  • Violated IPR rules set in RFC 3979
  • Sanction permitted by RFC 6701
FedFS Standards Progress

Security-related changes during IESG review

• Clarify TLS trust anchor management
  • FEDFS_SET_NSDBPARAMS provides entire trust chain
  • Certificate chain is DER-encoded on the wire
  • Certificate chain must not be used for any other purpose

• Mandate specific security flavor support for ADMIN protocol
  • RFC 5531 mandates strong security for new RPC protocols
FedFS Standards Progress
Current status

- Informational RFC 5716 (2010) spells out functional requirements

- Proposed Standard RFC 6641 (2012) specifies DNS SRV format

- NSDB and ADMIN protocol documents
  - Approved as Proposed Standards by IESG
  - IANA actions completed
  - In queue for RFC Editor, waiting for 3530bis to be completed
Standards Futures

• In progress
  • Multi-domain authentication and authorization
  • NSDB protocol support for SMB/CIFS

• Possible future work
  • Support for administering replication
  • Domain root discovery
    • Advertising or guessing local domain name
    • Populating /nfs4
  • NSDB security
    • Additional FEDFS_SEC modes
    • NSDB certificate revocation
    • FEDFS_REMOVE_NSDBPARAMS
FedFS on Linux

- fedfs-utils 0.8
  - Packaged in Fedora
  - Based on last year's drafts
  - No security
- fedfs-utils 0.9
  - Released recently
  - Compliant with latest proposed standards
  - NSDB security modes supported
- fedfs-utils next
  - RPCSEC for ADMIN protocol
  - Easy NSDB configuration
  - A rustic but complete implementation
Questions/Discussion