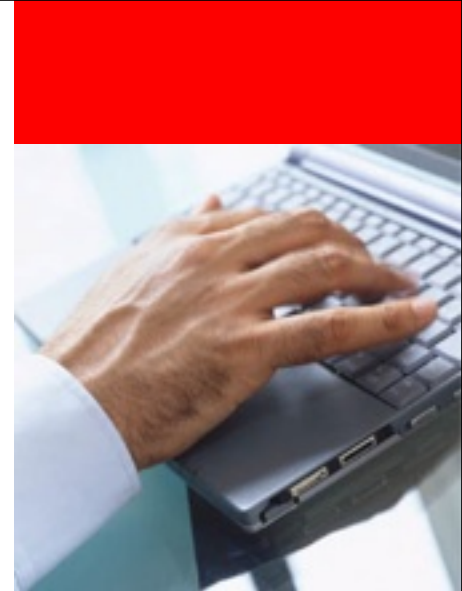# FedFS Standards Update

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FedFS Update

- Standards progress

- Linux FedFS implementation update

- Next steps

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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

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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?

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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

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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

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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

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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

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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

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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

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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