

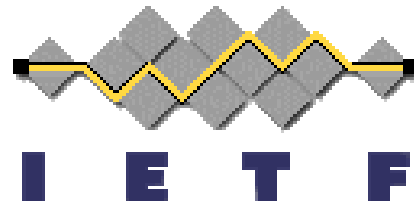
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# NFS Version 4 Attributes

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# Goals for Attribute Work

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- Extensibility via standards-track RFC
- Client able to get only the attributes it needs
  - No monolithic structure such as fatattr3
  - Client uses bit mask in GETATTR to select attributes
  - Attribute 0 is the list of attributes supported by the server
- Servers need not support all attributes
  - No more lying or fudging by servers
  - Mandatory (few) vs. recommended (many)
  - Servers should support all they reasonably can
- Recommended (not mandatory) support for extended attributes
  - For applications, passed transparently by protocol
  - Named data streams within hidden directory per object
  - Accessed by OPENATTR/LOOKUP/READ/WRITE

# Attributes Issues

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- Per-file vs. per-filesystem attributes combined
  - FSINFO/FSSTAT/PATHCONF subsumed into GETATTR
- Mandatory vs. Recommended decisions
  - Need justifications to declare attributes mandatory
  - Current standard: a lot of clients need the attribute and it is hard for the client to derive value
  - Could also try to assure minimal interoperability
- Known holes
  - ACLs must be defined (big job)
  - Need more formal, complete definition
  - Need to work out XDR encoding details
- What other attributes can be clearly defined for V4?
  - Nominate your favorites!

# Some Attributes

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- Mandatory set is small
  - `supp_attr`, `object_type`, `object_size`, `change` (for caching)
- User and Group Owners: now UTF-8 strings for universality
- Time values more diverse
  - `access`, `create`, `modify`, `metadata`, `backup`
- Content awareness: `mime_type`, `version`
- Booleans: `persistant_fh`, `extended`, `link_support`, `symlink_support`
- Filename, filehandle are requestable for READDIR support
- Unix mode deprecated in favor of ACLs
- Some new things added
  - `hidden`, `archive`, `system`, `time_delta`, `volatility`
- Familiar things remain
  - `file_id`, `links`, `fsid`, `transfer size maxima`, `maxfilesize`
- Quota support to come