

# NFSv4.2 Sparse files

Marc Eshel

11/03/10

[eshel@almaden.ibm.com](mailto:eshel@almaden.ibm.com)

# NFSv4.2 Sparse files

- I propose to add Sparse file support to NFSv4.2
- Sparse file are common way to represent huge files
  - Database files
  - HPC applications
  - Virtual machine images
- Application are not aware of file organization
  - Read holes
  - Prefetch holes

# NFSv4.2 Sparse files

- Simple change to NFS read RPC
- New return code when holes are read
  - Don't return data that is all zeros
- Return extra information with new return code
  - Next data offset
  - Length of data

Changes to the READ rpc:

Operation 25: READ - Read from File

...

RESULT

```
struct READ4resok {
    bool        eof;
    opaque      data<>;
};

+ struct READ4reshole {
+     offset4    data_offset;
+     length4    data_count;
+ };

union READ4res switch (nfsstat4 status) {
    case NFS4_OK:
        READ4resok    resok4;
+     case NFS4ERR_HOLE:
+         READ4reshole    reshole4;
    default:
        void;
};
```

DESCRIPTION

...

+ If return code NFS4ERR\_HOLE is returned than entire read range can be  
+ assumed to be zero.  
+ The offset in READ4reshole might be set with the location of the next  
+ chunk of data and count is the length of the chunk. If count is set to  
+ zero just ignore the information in READ4reshole.