

X509 in NFS

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CESNET

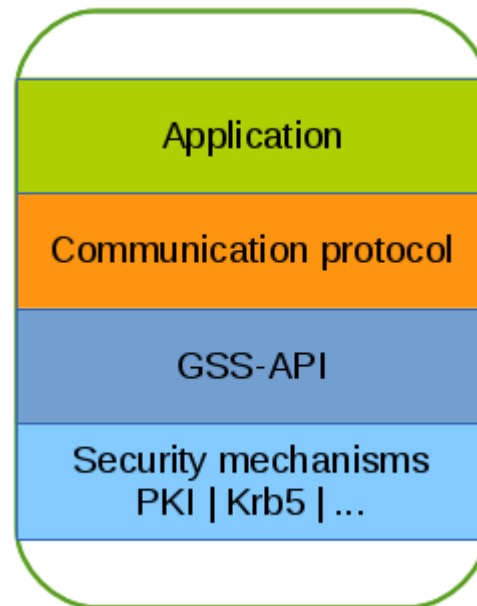
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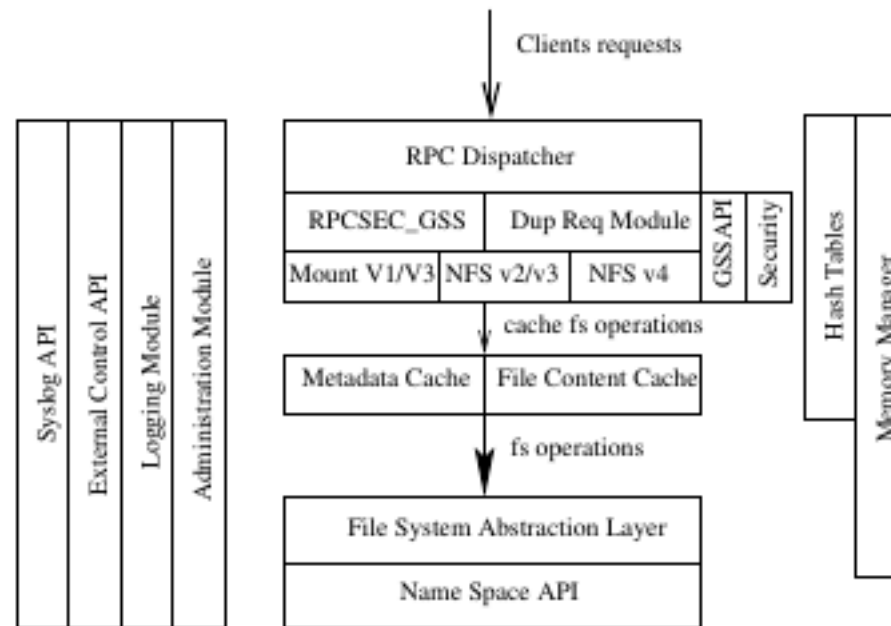
- X509 authentication in NFSv4 – access to data using (proxy) certificates
- Experience from other project (Moonshot) with federated identity authentication on server
- Did not know Ganesha code
- Experienced with nfs-utils clients

- Generic Security Services Application Program Interface
- Key component, just API – IETF RFC standard, not implementation
- implemented in libraries – Kerberos(+mechglue), Globus
- Used by programs to access security functions:
 - Authentication, Integrity, confidentiality

- Client – Server
- Multiple underlying security mechanisms to choose from (krb5, PKI)
- Changing GSS-API not necessary means rewriting existing code – in practice except credentials handling
 - (Open Source products vs Open Source implementations)



- NFSv3,v4,v4.1 fileserver, currently in version 2
- Runs in user-space
- Highly layered
- FSALs
- **Use GSS-API**



Source:GANESHA,amulti-usage with large cache NFSv4 server
 Philippe Deniel, Thomas Leibovici, Jacques-Charles Lafoucrière
 CEA/DIF

- Two levels of authentication – Mount protocol (+kernel calls) and user access FS (user-space)
- Kerberos Example:
 - Mounting with host identity (host credentials – e.g. [nfs/host@realm](#))
 - nfs daemon running in kernel level – mount protocol
- Gssd - access to FS with user identity (user credentials – e.g. kerberos user's TGT)

- Tested Ganesha server with VFS FSAL
- Ganesha with Kerberos mechanism to play with GSS-API calls
- GSS-API well used in the code
- Existing code and experience for the X509 in NFS from another project based on GLOBUS libraries

- Knowing building process (cmake)
- Now trying to switch Ganesha to use GLOBUS GSS-API implementation
- Client side expecting issues:
 - Cryptographic keys transfer to kernel in krb specific format ->
 - May require X509 -> krb format transition ?
- We can link nfs-utils with mechglue library -> should be able to have testing nfs client quickly (still encounter credentials format transition)

Thank you