

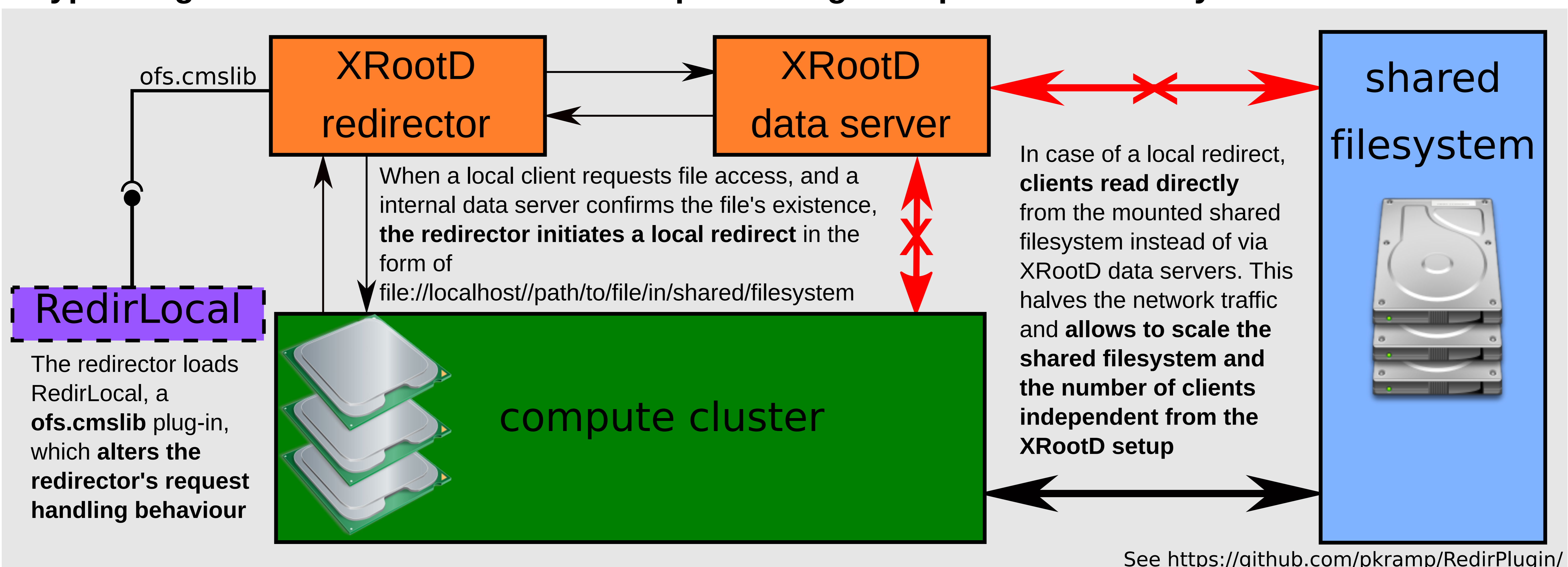
XRootD plug-in based solutions for site specific requirements



In the present, **HPC centers and opportunistic resources** have become a common way to fulfill the computing and storage needs of modern research in HEP and HENP. **Integrating these more closed off systems in existing WAN infrastructures** brings forth new challenges and requirements. At GSI, recently developed **solutions** fulfill essential needs of these new approaches.

XRootD redirector plug-in: RedirLocal

Bypassing bottlenecks with XRootD setups running on top of shared filesystems



Enable local redirection in ROOT for high performance data processing

```

WELCOME to ROOT
Version 5.34/30 23 April 2015
You are welcome to visit our Web site
http://root.cern.ch

ROOT 5.34/30 (heads/v5-34-00-patches@v5-34-28-57-gec27989, Jun 15 2018, 11:08:00 on linuxx86_64gcc)

CINT/ROOT C/C++ Interpreter version 5.18.00, July 2, 2010
Type ? for help. Commands must be C++ statements.
Enclose multiple statements between { }.
root [0] gDebug=1
(const int)1
root [1] auto f=TFile::Open("root://lxbk0200//tmp/test_root.root")
Info in <TNetXNGFile::GetVectorReadLimits>: Local redirect, using default values
(Class: TFile)0x2cf4490
root [2] f->ls()
TNetXNGFile**root://lxbk0200//tmp/test_root.root
TNetXNGFile**root://lxbk0200//tmp/test_root.root
    
```

Additional changes have been implemented to enable local redirection in ROOT. Build ROOT with:

- **XRootD >= v4.8** (enables TNetXNGFile, uses XrdCI)
- **Necessary changes to TNetXNGFile** (Pull request filed to ROOT6 github)

Changes at: <https://github.com/jknedlik/root/commits/5.34.30.a.10.lr>

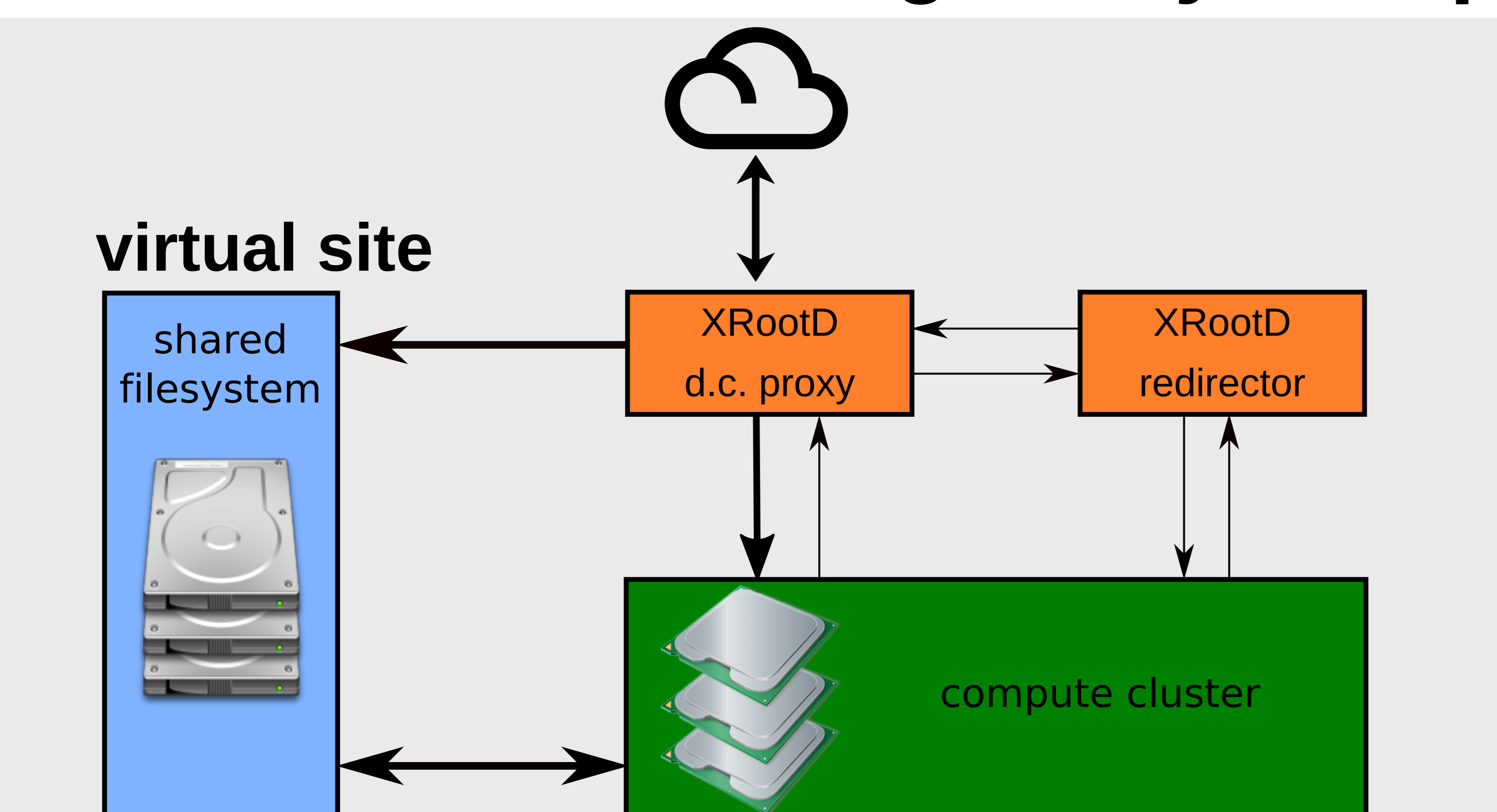
Changes to and dependencies on XRootD

Additional changes have been implemented into the XRootD base code in cooperation with the core development team.

- **Enables local redirection of clients from redirectors**
- **Available since XRootD v4.8**

Changes at: <https://github.com/xrootd/xrootd/commit/76108af>
<https://github.com/xrootd/xrootd/commit/ef28e28>

XRootD Disk Caching Proxy for opportunistic resources



In cooperation with KIT, an infrastructure for the **utilization of opportunistic resources such as clouds as virtual sites**, has been developed. The idea is to **minimize external I/O and to provide high data locality using an XRootD disk caching-proxy** together with bundled jobs accessing the same data.

Clients request files via a redirector. If the files are cached, clients are redirected to the XRootD data server or shared filesystem. If not, they access the remote files via a disk caching proxy, which then also handles caching of the new data.

This infrastructure relies on developed XRootD-plug-ins. One plug-in handles the referral to the redirector while the second plug-in handles the redirection to the proxy or shared file system. A test setup has been deployed on the bwhepc4 cluster NEMO at Freiburg.

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Jan Knedlik
 j.knedlik@gsi.de

see <https://github.com/pkramp/RedirPlugin/kit-proj>