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Record & replay

Outline

- Motivation
- Recorder plug-in
- Replay tool
- Demo

Motivation

- **Allow to emulate real applications without running complex runtime environments**
  - Facilitate **benchmarking** and **debugging** of storage systems

- Based on two components:
  - **Recorder plugin**: records all client actions in a *CSV* file
    - One can **load the plugin into any 'black-box' application** that use XRootD client without modifying the source code
  - **Replay tool**: replay all client actions
    - Preserving original timing

Recorder plug-in

- Will be available in **xrootd-client-recorder** sub-package
    - In order to accommodate older **XRootD4 clients** we will also provide a back-ported version as a separate package
    - Scheduled for **5.5.0**

- Example configuration file:

```
url = *
lib = /usr/lib64/libXrdClRecorder-5.so
enable = true
output = /tmp/out.csv # optional
```

Recorder plug-in

- User's actions are stored using **CSV file format**

  - We do **support quoting** so it is safe to use comas in URL opaque info

- By default the file is stored at: **/tmp/xrdrecord.csv**

  - This can be overwritten either in the config file **using the *output key***, or

  - Using an **environment variable:** XRD_RECORDERPATH

- Introduces only **minimal or no overhead**

Replay tool

- To replay the registered actions:

  xdreplay /tmp/xrdrecord.csv

- Alternatively one can do the replay from *stdin* (e.g. if the *CSV* needs to unzipped):

  cat /tmp/xrdrecord.csv | xrdreplay

- There are 4 operation modes:

  - **Print mode**: display runtime and IO statistics for given *CSV*
  - **Verify mode**: verify that the required input files exist
  - **Creation mode**: create required input data
  - **Playback** (default): replay given *CSV*

Replay tool

- User friendliness

    - Print: long format / summary / **json formatted output**

    - Replace: **rewrite URLs of input and output data**

    - **Create input files if missing** (write either *0s* or well defined patterns)

    - By default reject to replay recording files with error responses

        - Unless force is used

- For the complete documentation please visit: https://github.com/xrootd/xrootd/tree/master/src/XrdApps/XrdCIRecordPlugin

Demo & questions?