Quantifying XRootD Overhead

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Understanding The Test Architecture

- Client and Data located at STFC
- Client uses xroot protocol (xrdcp) for all tests
- Data Transfer is always within STFC
- Transfer Times should be (approximately) constant

Scalability Tests
- Tests performed using test storage system, but production worker nodes
- Two tests of concurrent usage of XRootD (reading/writing)
- Write tests write unique 2GB files into storage
- Read tests select 1 of 100 unique 2GB files for reading
- Increase the number of worker nodes
- All tests use the same redirector

Performance Tests
- Uses CMS production infrastructure
- Using load test files (all the same size)
- 100 consecutive reads, each of a random file
- Tests repeated using local, European and Global redirectors
- Single (dedicated) client running test
- Recall transfer is local regardless of redirector

Scalability Test Results

- Each test repeated 5 times
- Performance scales linearly with number of clients
- Rates increase at 30MB/s/client
- Write rates increase at 26 MB/s/client
- No significant increase in memory usage by the redirector observed

Summary

Note: Tests used production batch system and may have had to share bandwidth

Overhead Test Results

Summary

- Performance overhead 0.3-1.5 seconds/hop’
- Significantly better than SRM (1-10 seconds at STFC)
- Within WLCG on-line data should never be more than 10 seconds away