

XtreemOS

*Enabling Linux
for the Grid*



WP3.4 – XtreemFS

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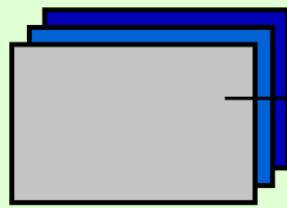
Overview

- Grid Datamanagement
- XtreemFS
- Architecture
- Replication
- Security in XtreemFS
- Performance Evaluation



metadata

Metadata and
Replica Catalog



← retrieve file location



Client with local file system

← request

1

User
Application

data →

← download file

3

5

contents

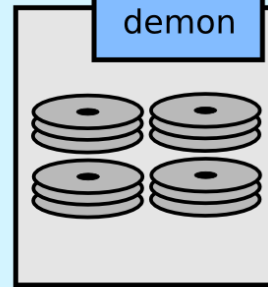
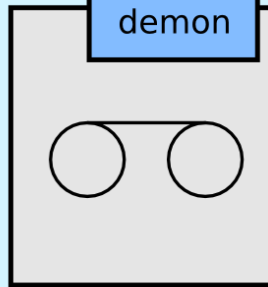
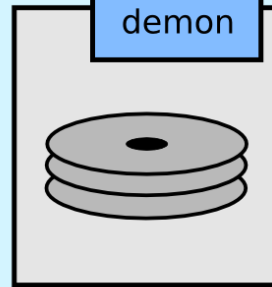
data →

4

access
demon

access
demon

access
demon



Storage Resources



Grid Datamanagement

simple access to heterogeneous storage, but ...

- in general, whole files have to be transferred and stored locally
 - high latency to first access
 - potential waste of network and storage resources
 - local access might be slower than network access
- no automatic replica consistency
 - usually restriction to write-once usage patterns: download of input files, upload of output files
- no access control on downloaded copies



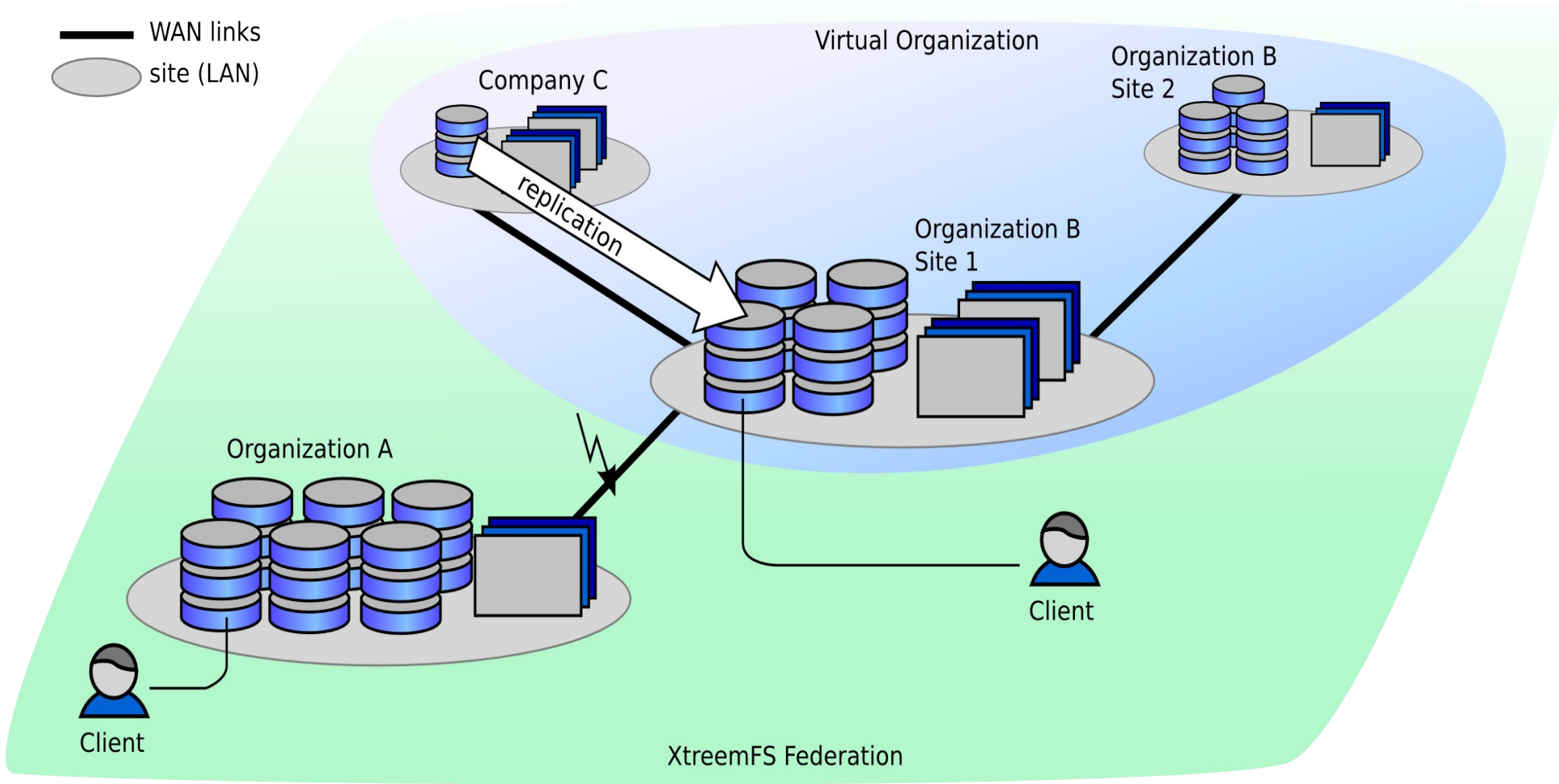
XtreamFS – a file system for the Grid

- Operates natively over WANs
- Fully POSIX compliant
 - You can run everything on top of it
 - NFS close-to-open semantics
 - or caching with locks for regular POSIX semantics
- Parallel access to striped files
- WAN replication



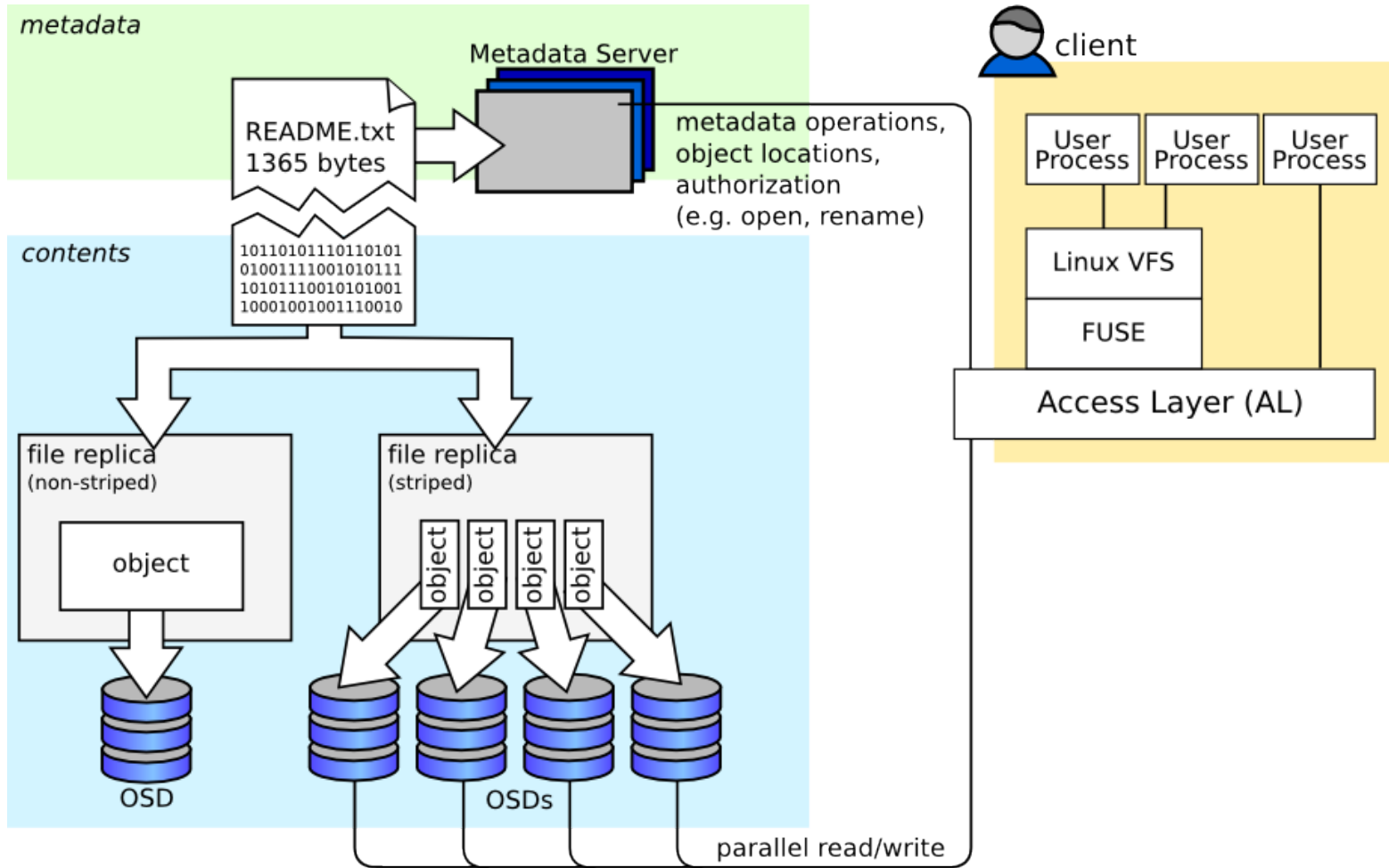
XtremFS Environment

- WAN links
- site (LAN)





XtreamFS Architecture



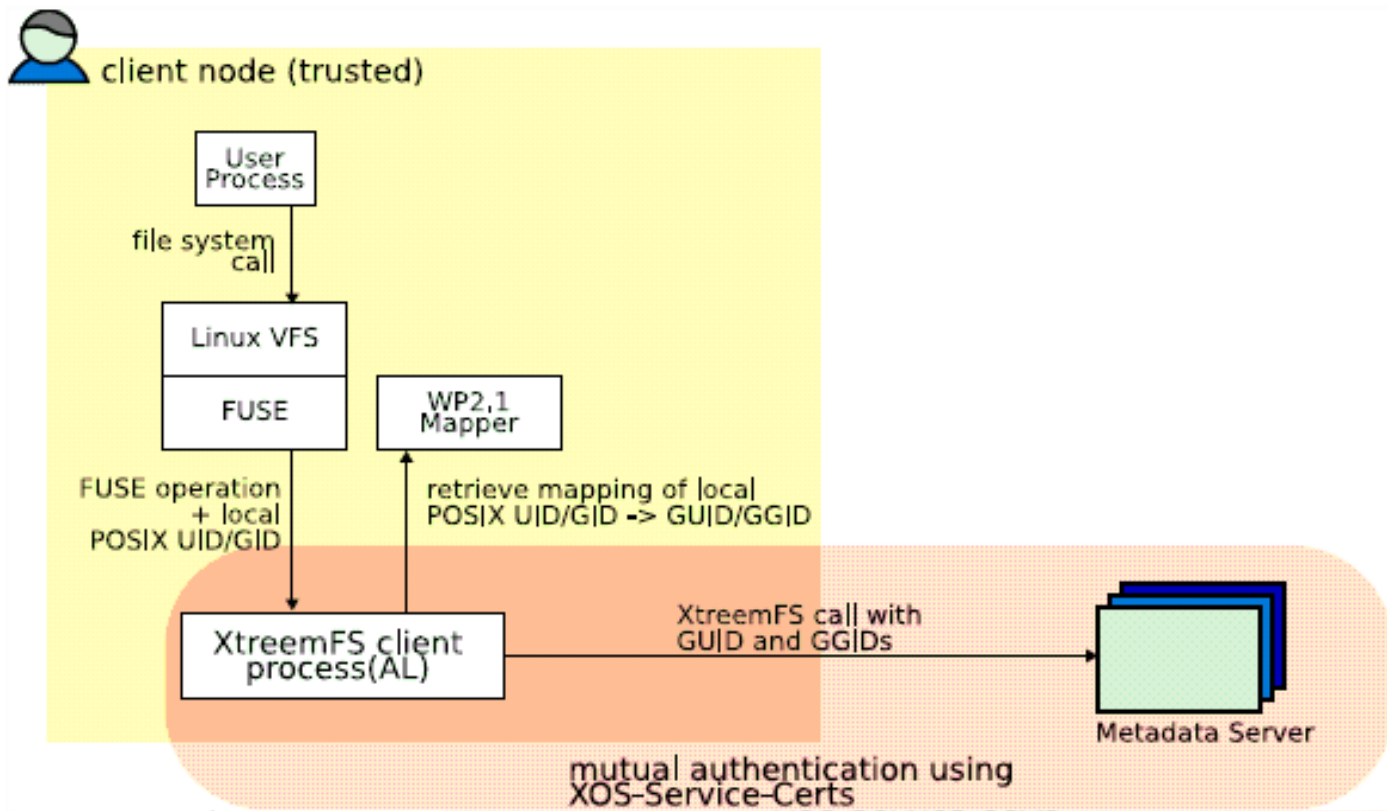


Replication

- Replication of files
 - fully transparent to client
 - guarantees POSIX consistency of data
 - can deal with failures
- Consistency coordination
 - currently at object level
 - synchronous, asynchronous or on-demand
- Metadata is stored in replicated DB (master/slave scheme)

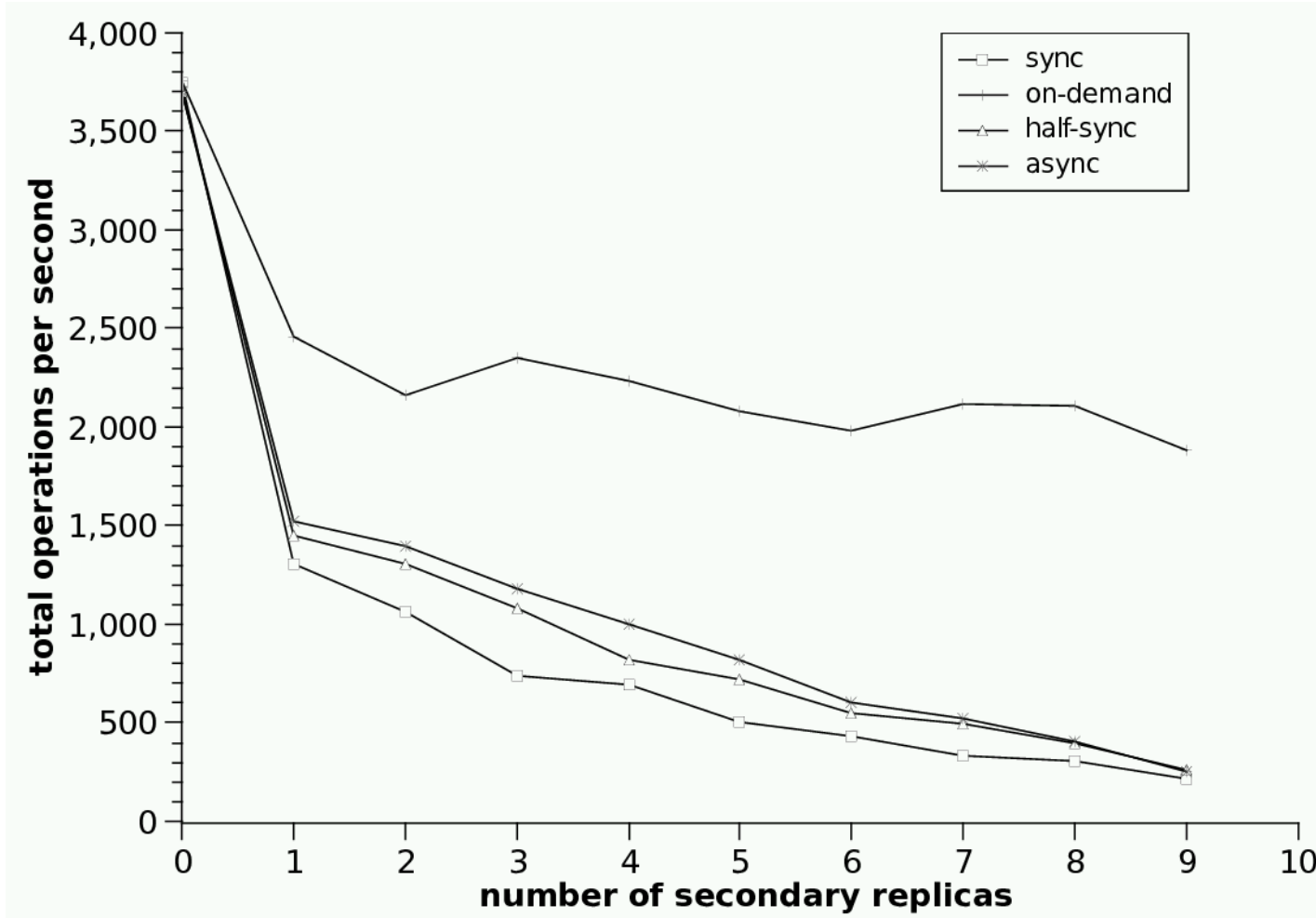


XtreamFS Security



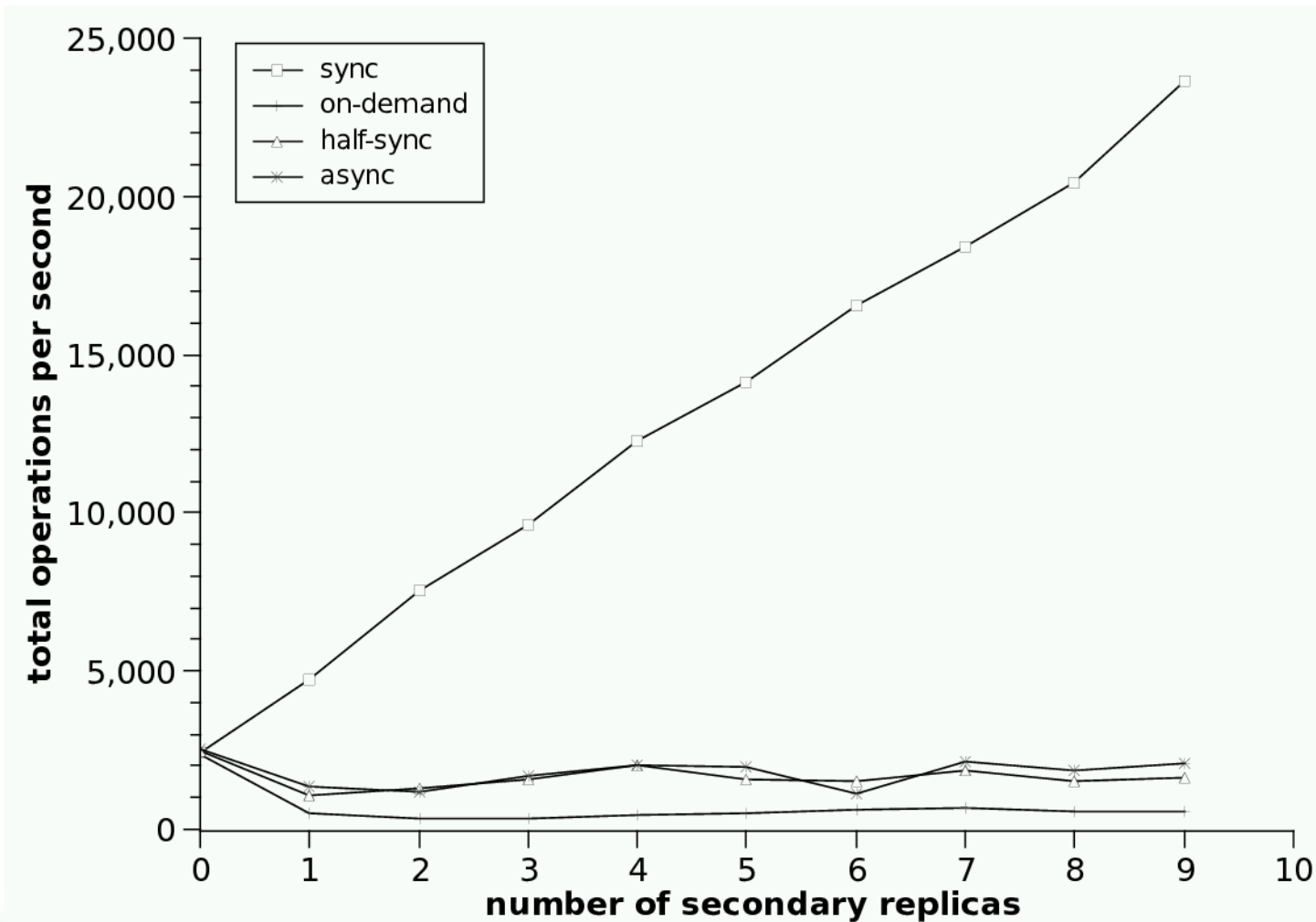


Experimental - write to replicated file (LAN)



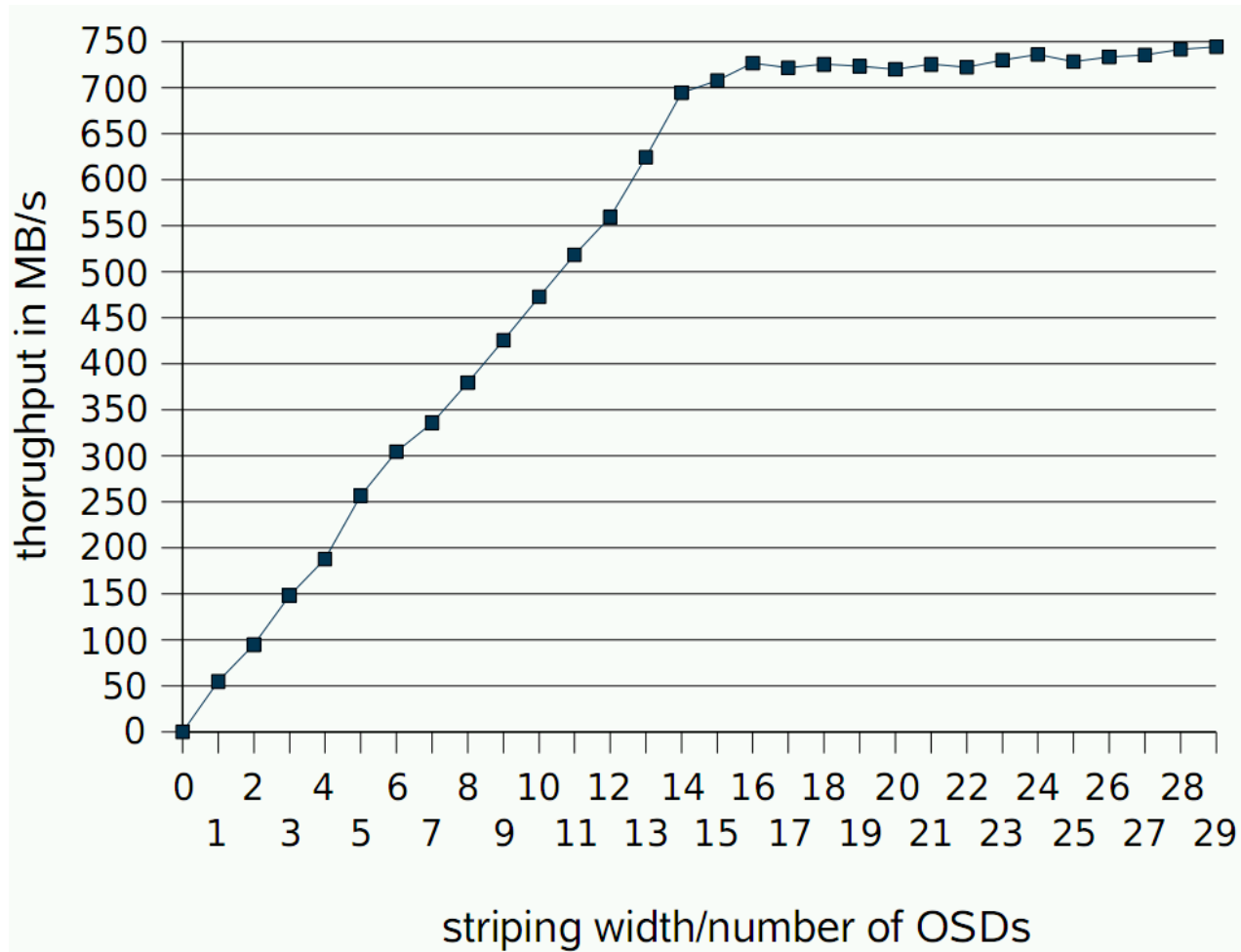


Experimental - read from replicated file (LAN)



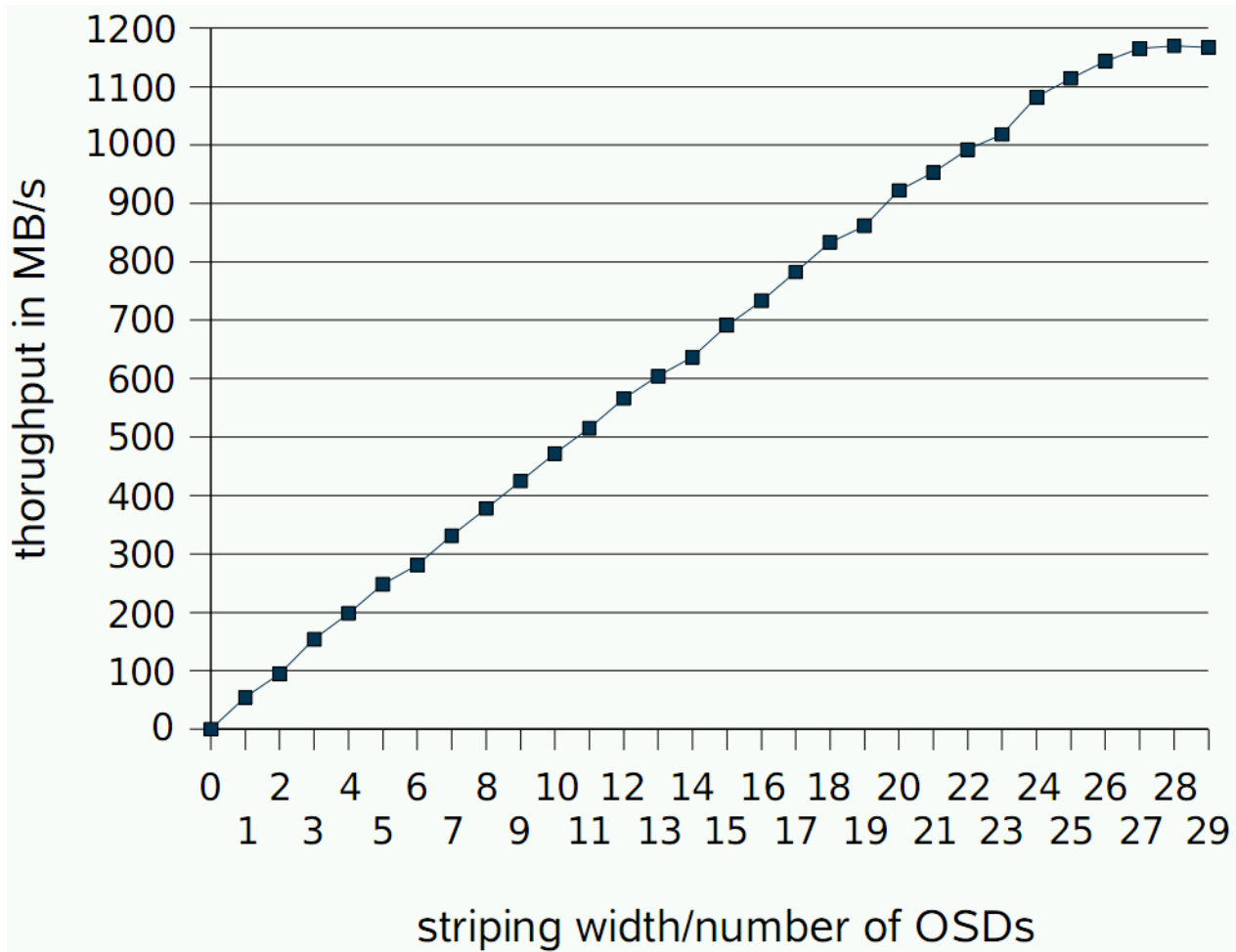


Parallel I/O - Read





Parallel I/O - Write





Release

- XtreemFS 1.0 is part of the upcoming XtreemOS release
 - full POSIX compliant parallel file system
 - SSL connections, integrated with XtreemOS VO/Security mechanisms
- Website www.XtreemFS.org