

# Scalable Storage Support for Data Stream Processing

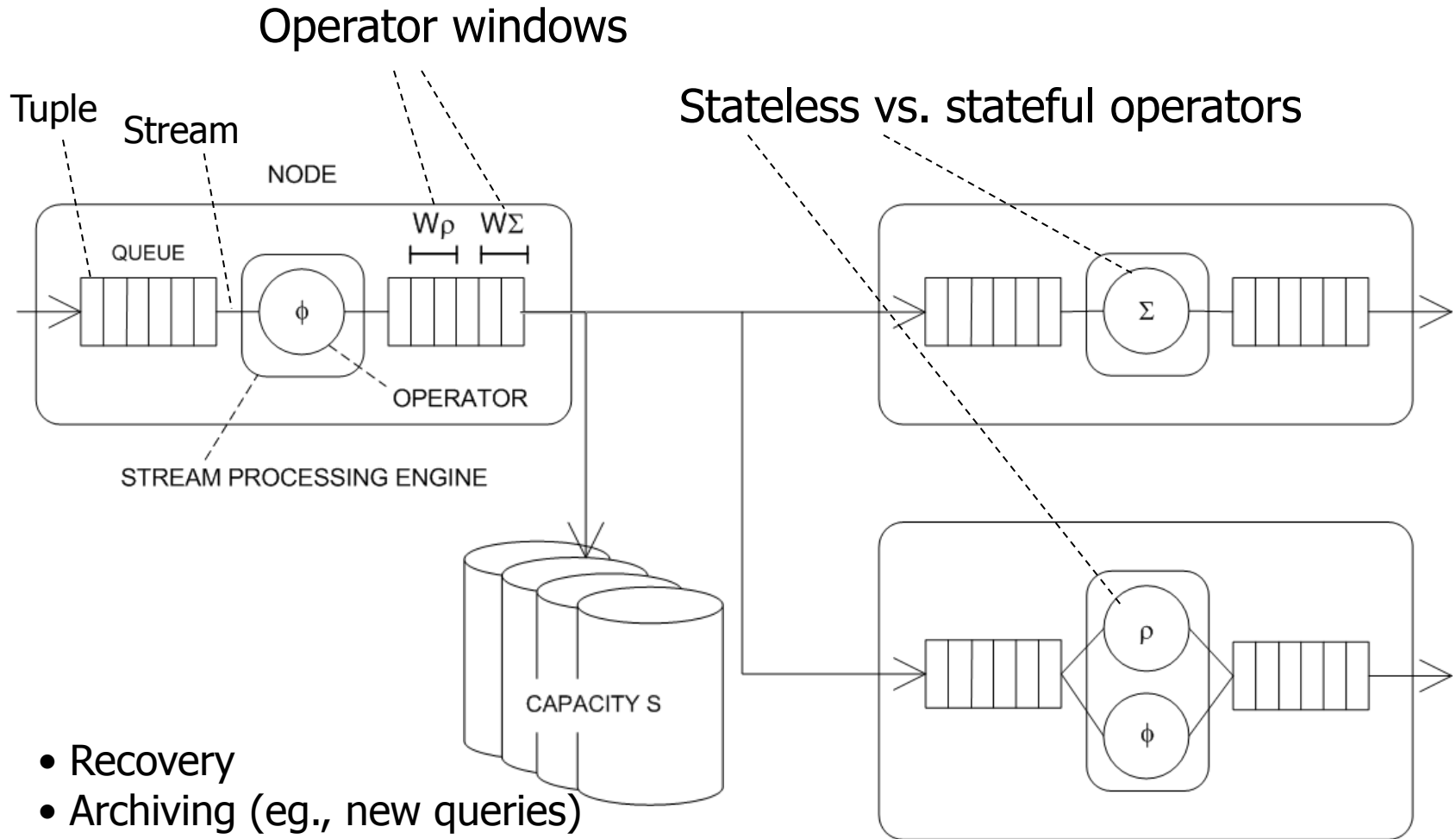
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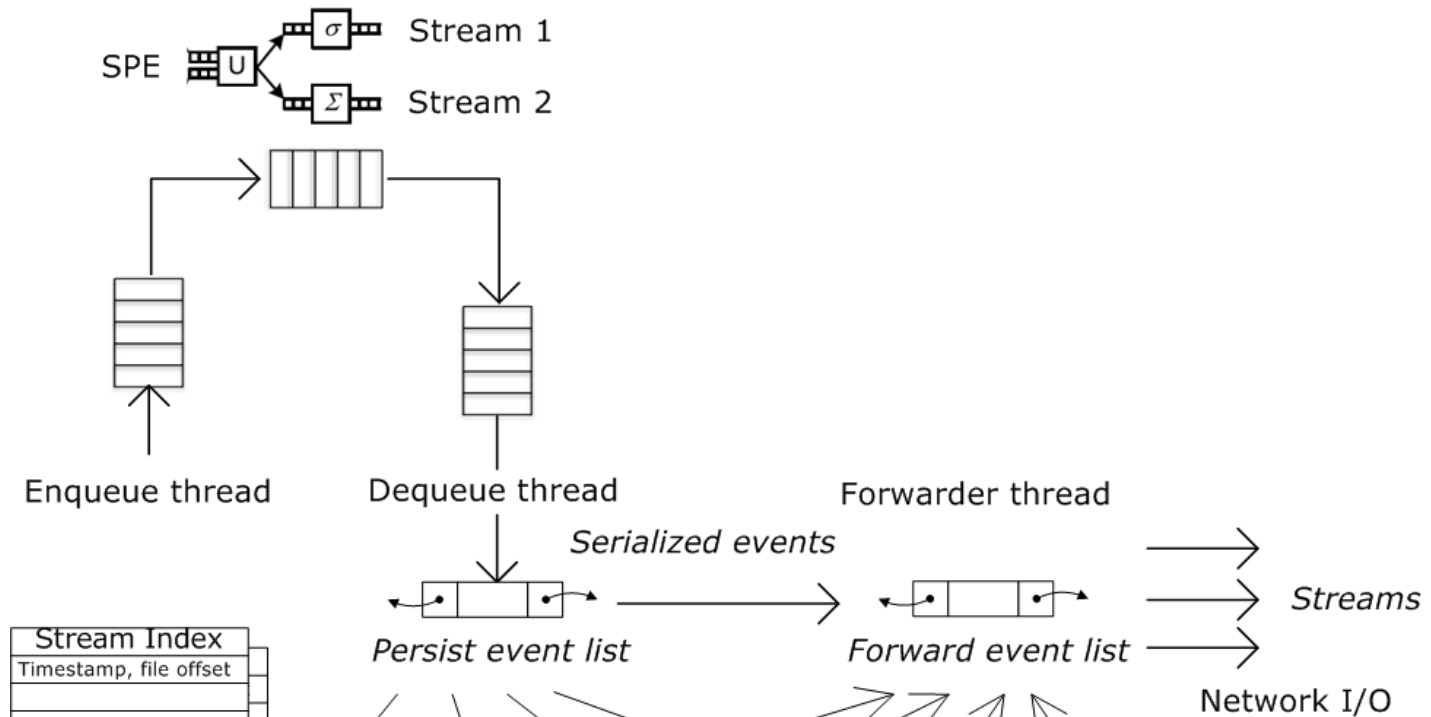
Heraklion, Greece

# Data Stream Processing Model

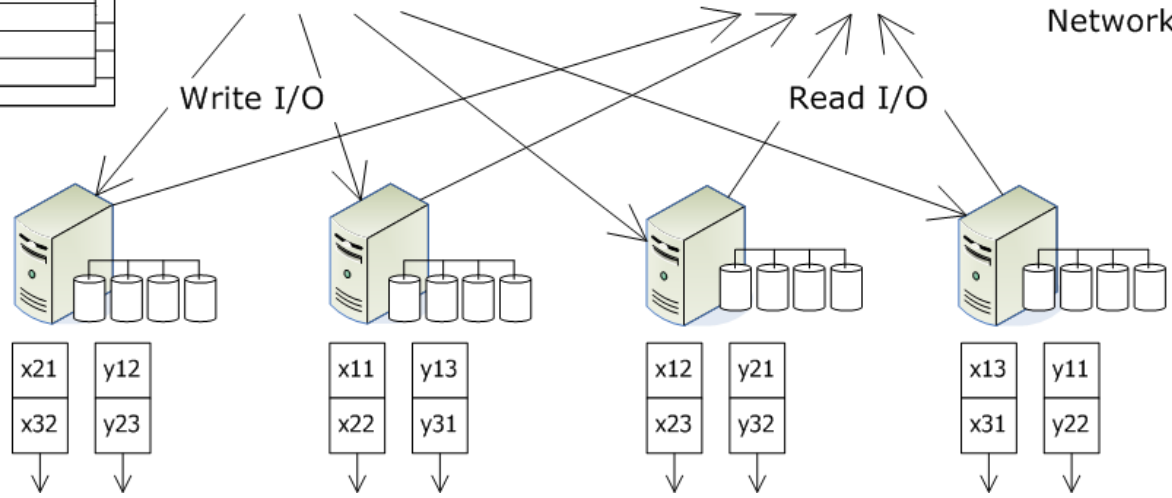


# Persistence Architecture

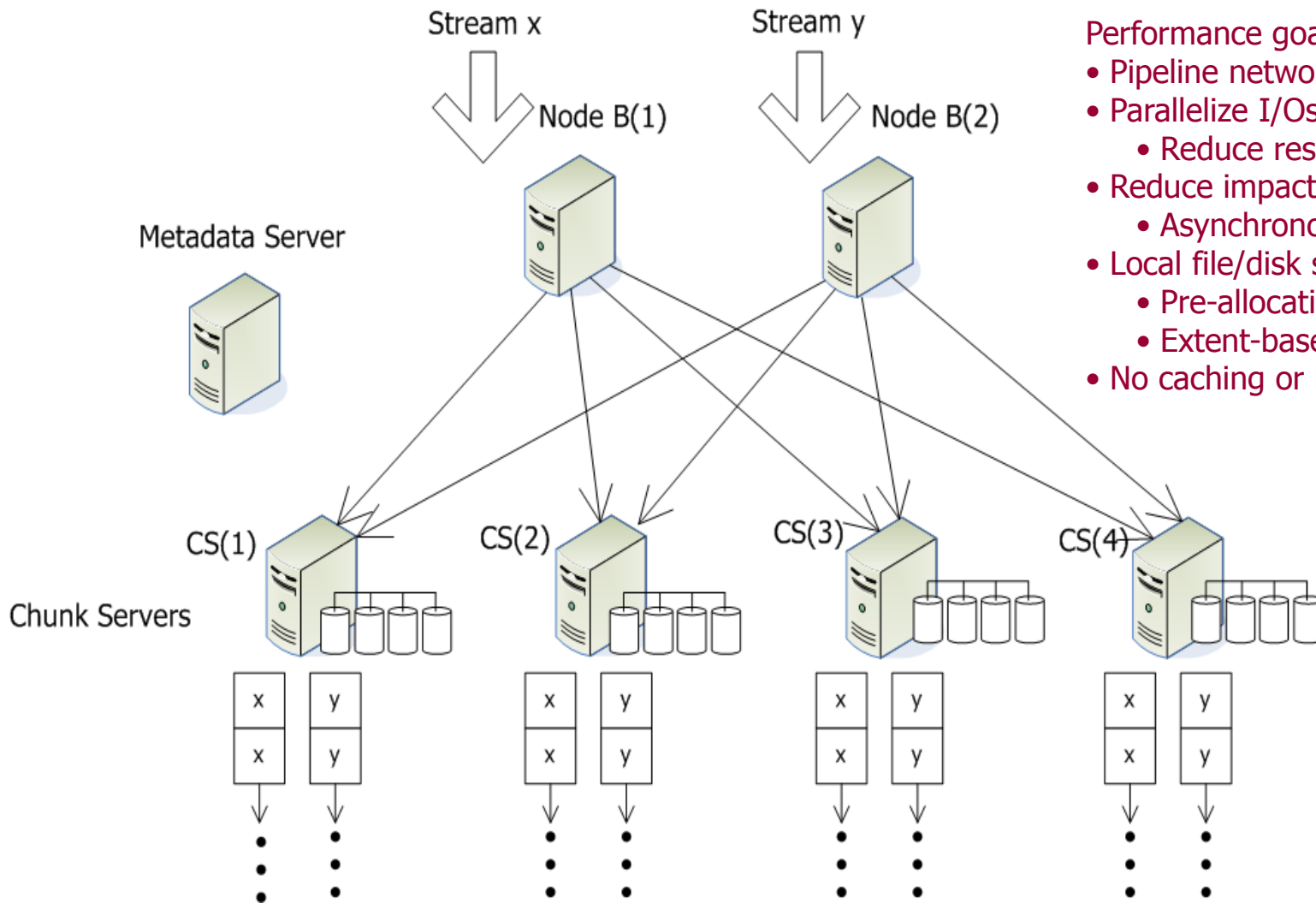
Borealis



PVFS2



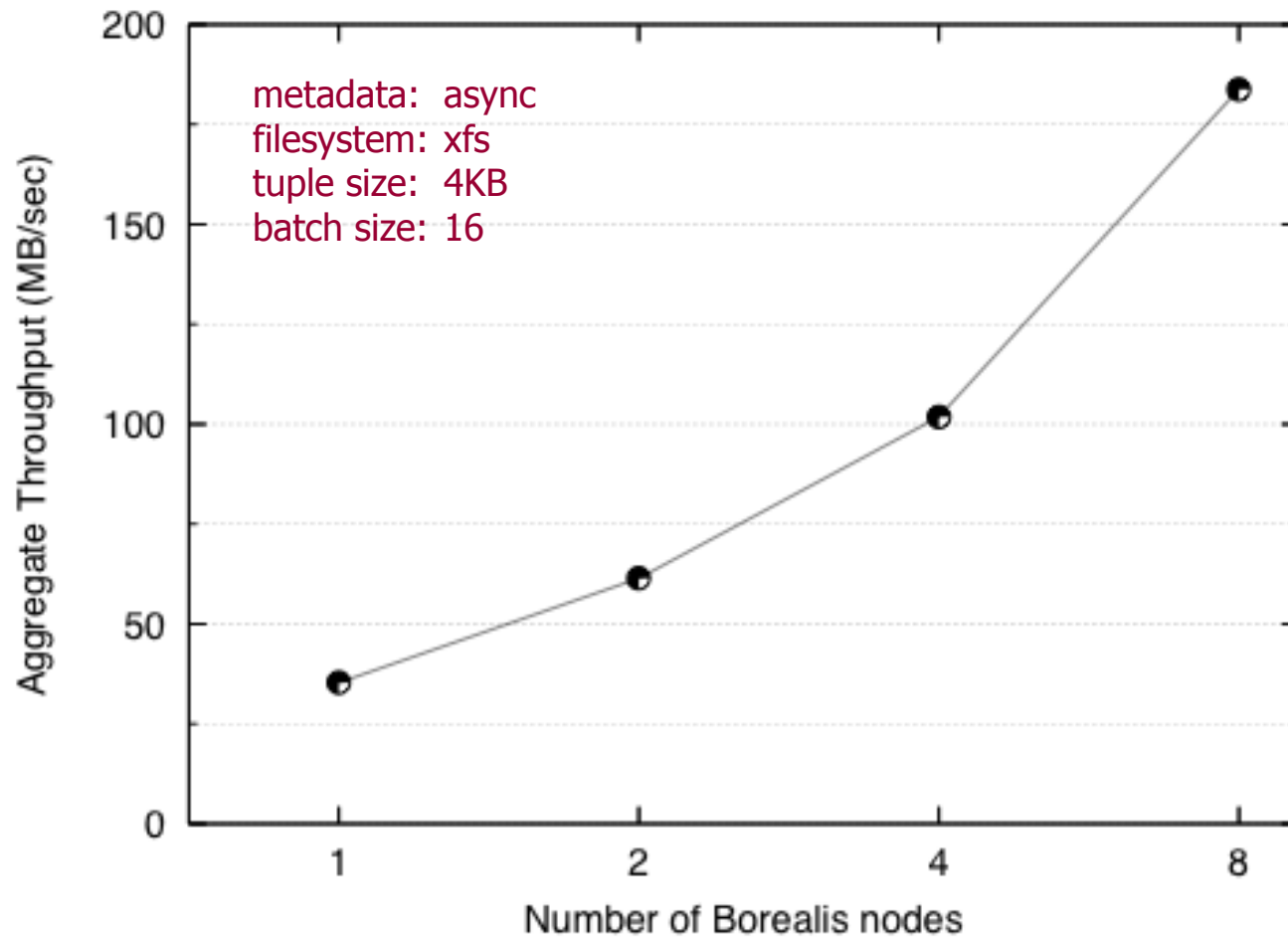
# Lessons Learned



Performance goals :

- Pipeline network/disk
- Parallelize I/Os
  - Reduce response time
- Reduce impact of metadata
  - Asynchronous updates
- Local file/disk subsystem:
  - Pre-allocation
  - Extent-based allocation
- No caching or locking

# Evaluation



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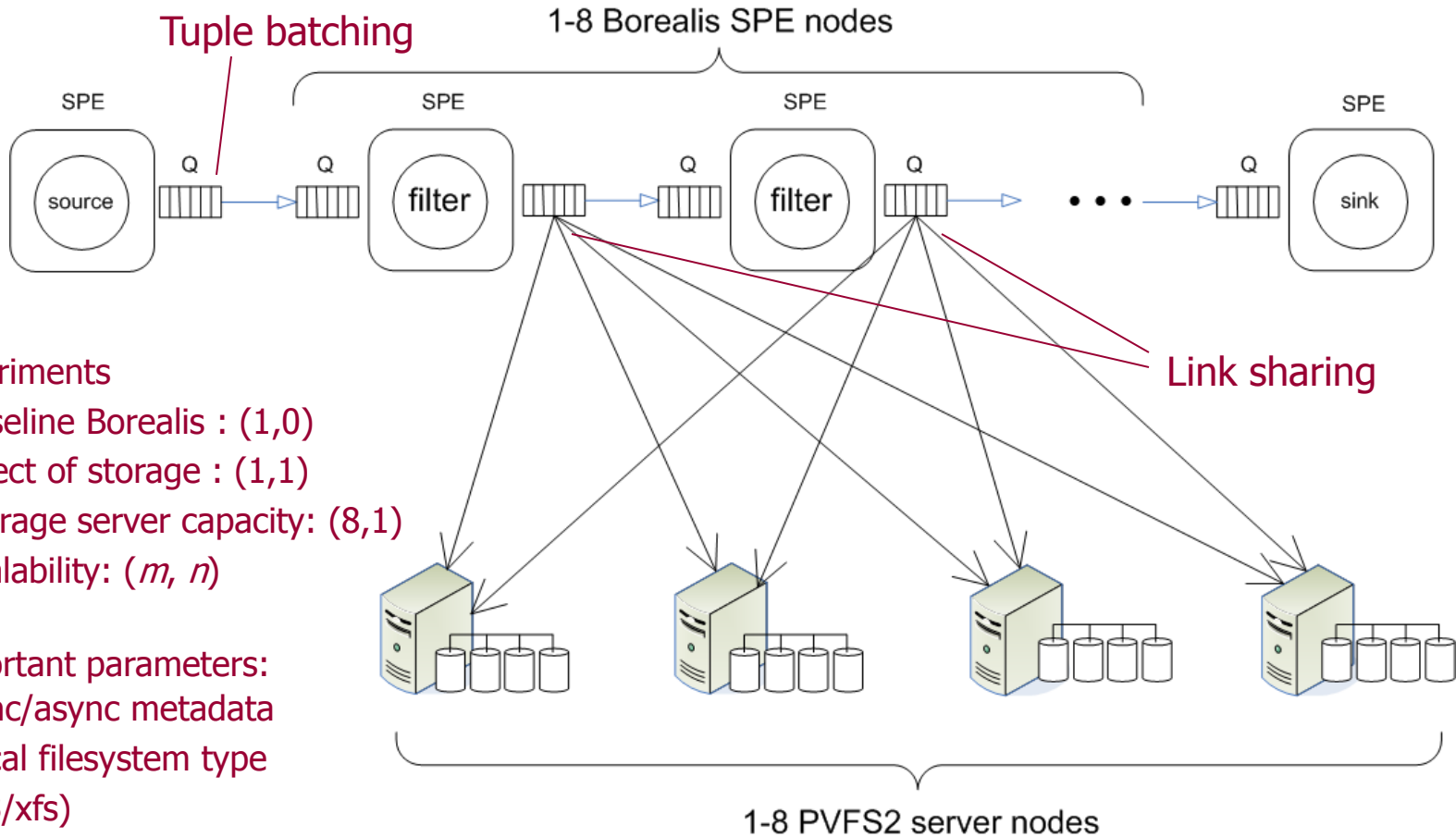
Thank you!

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# Backup

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# Evaluation



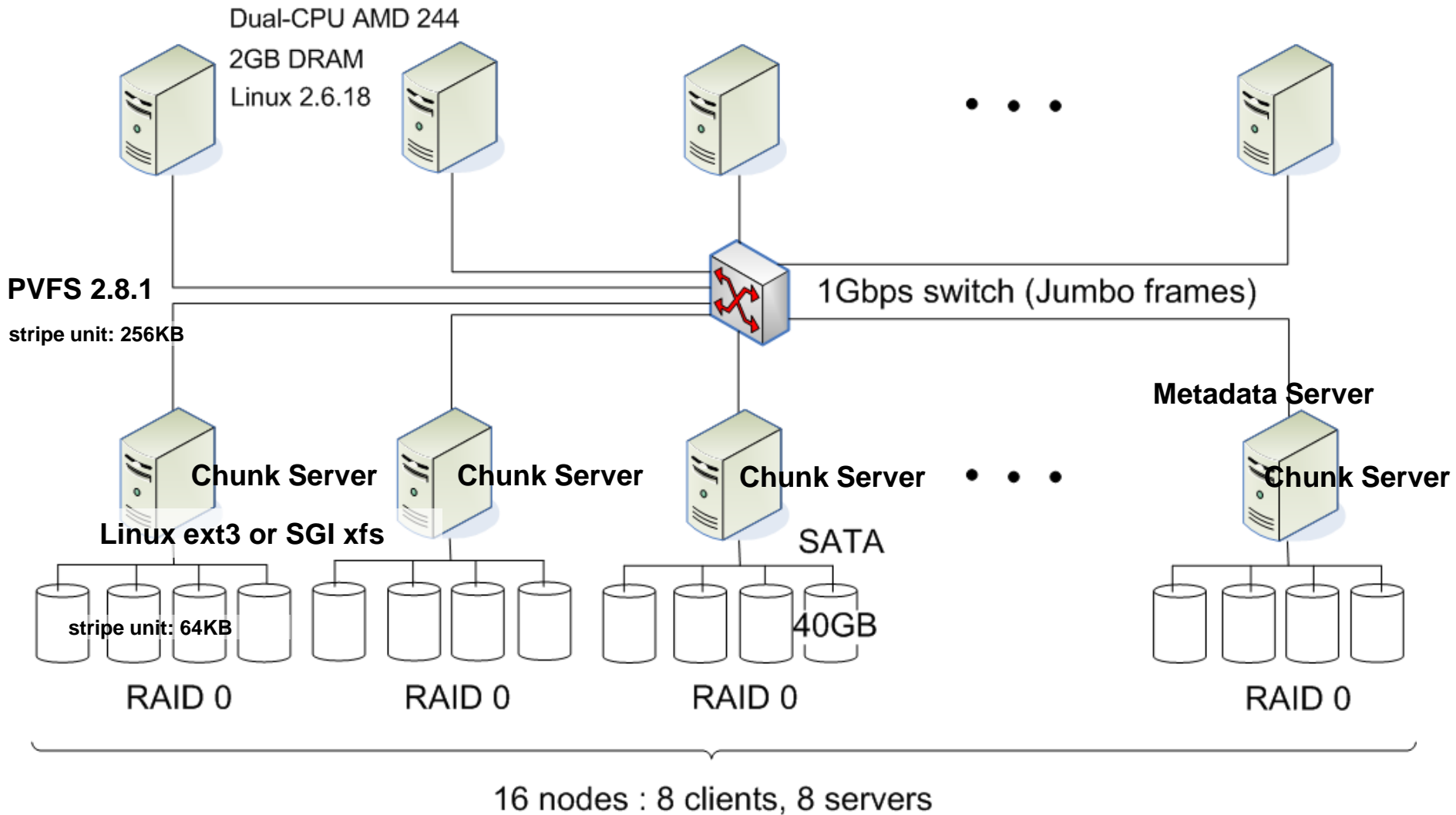
## Experiments

- Baseline Borealis : (1,0)
- Effect of storage : (1,1)
- Storage server capacity: (8,1)
- Scalability: ( $m, n$ )

## Important parameters:

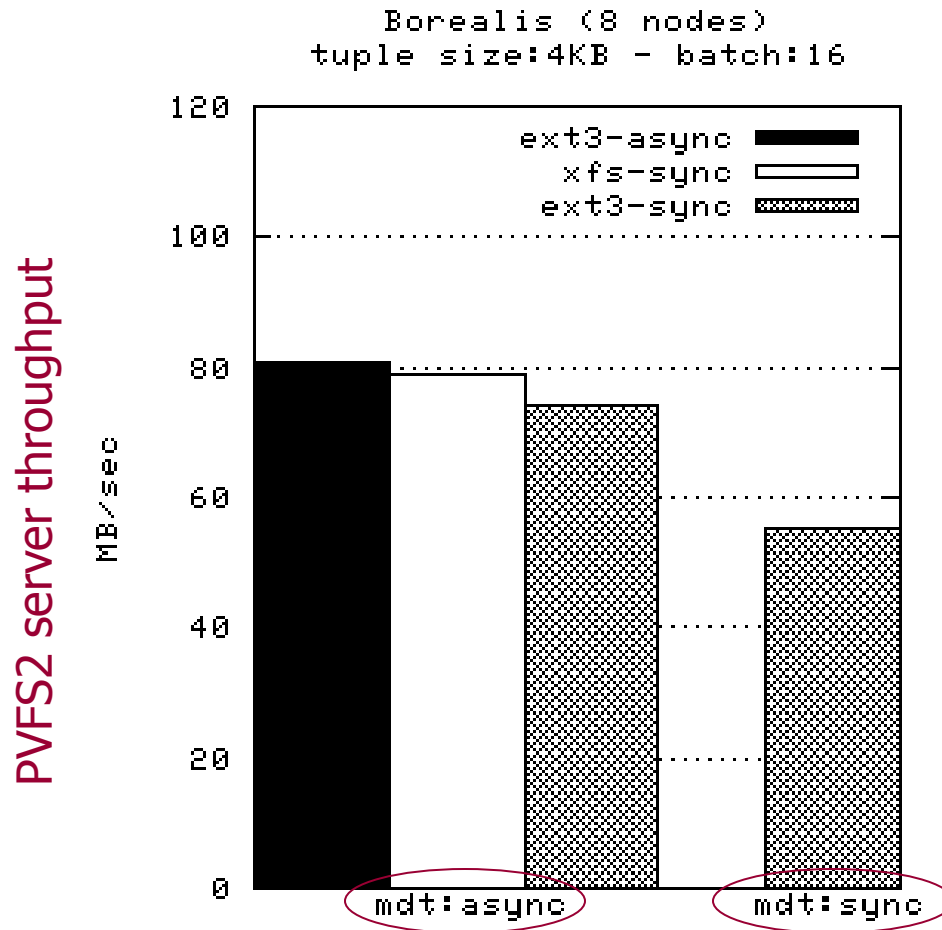
- Sync/async metadata
- Local filesystem type (ext3/xfs)

# Experimental Testbed

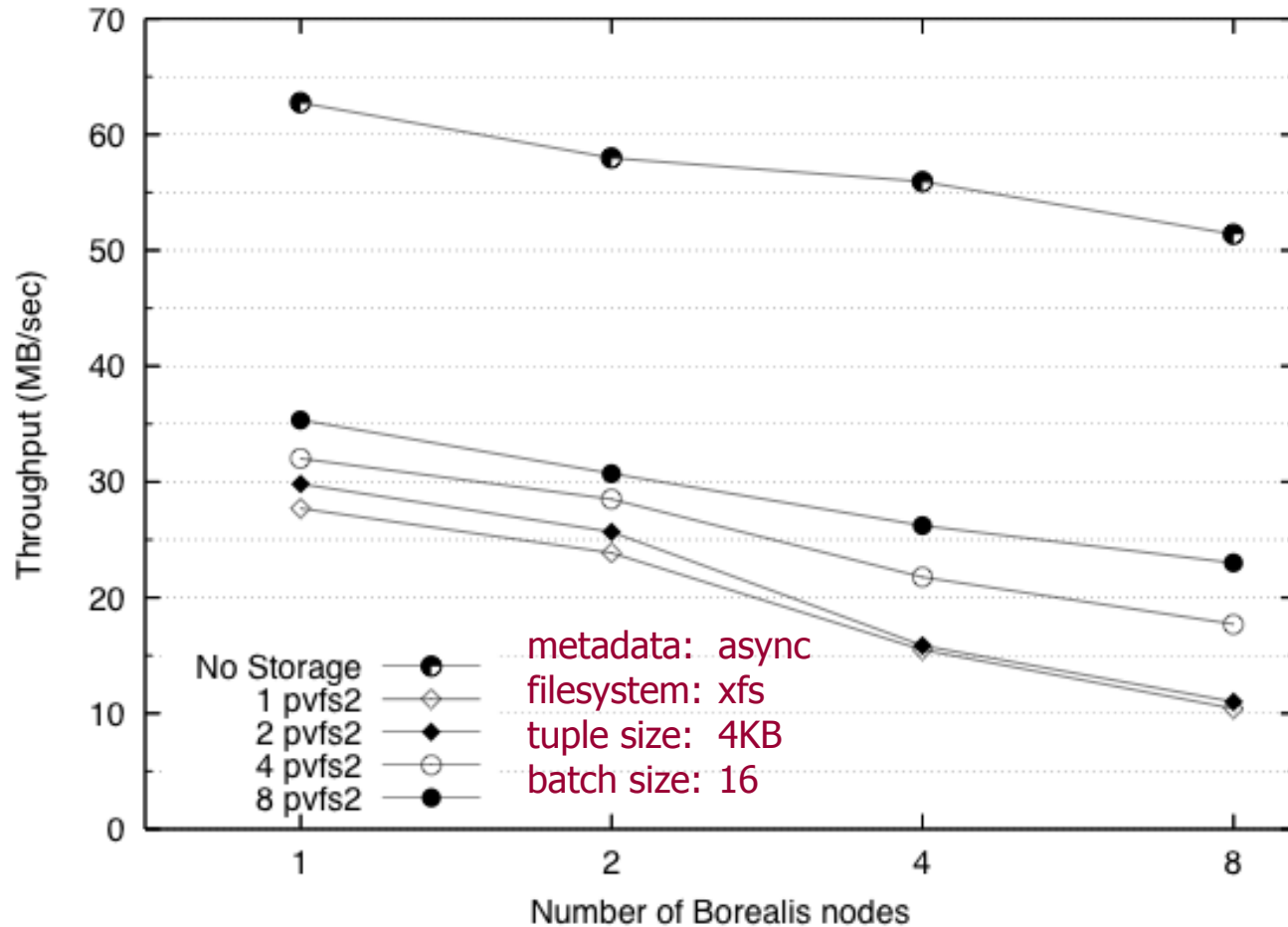


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# Saturate PVFS2 server: (8, 1)

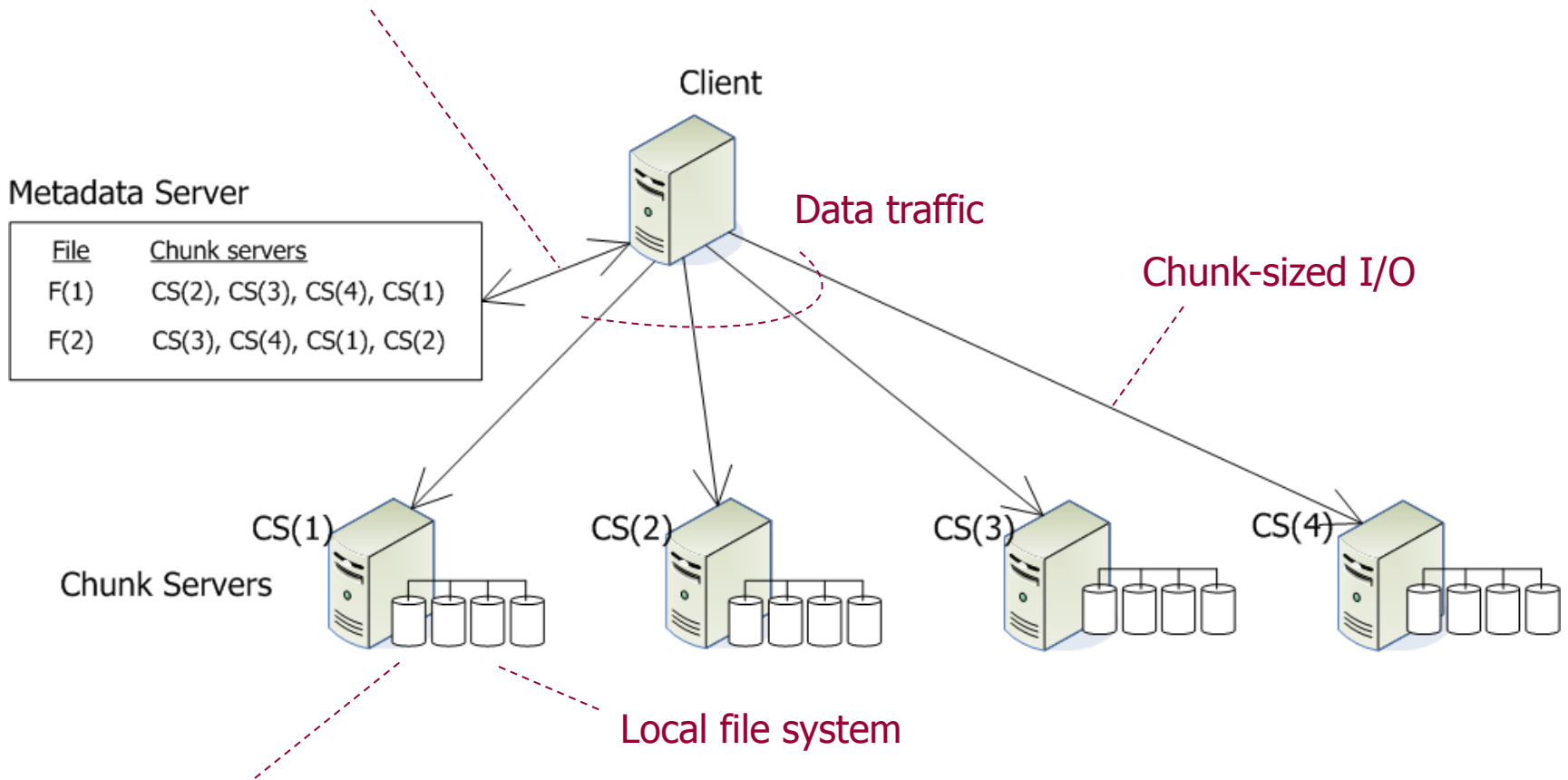


# Scalability: Borealis throughput



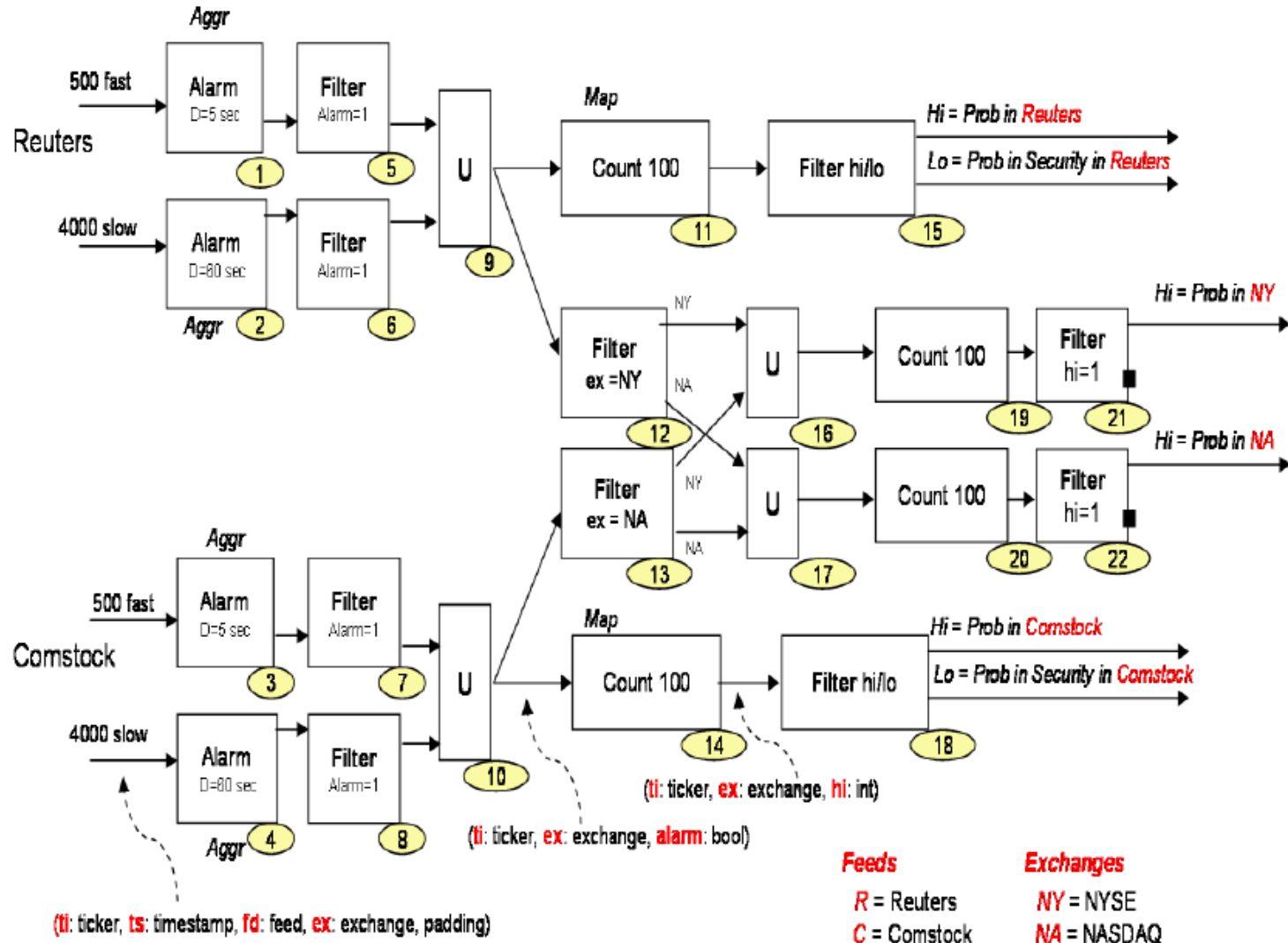
# Parallel file system

Metadata traffic (create, map name-handle, update size/atime/mtime)



Local metadata traffic (create, map handle-local filename, update size/atime/mtime)

# Example application: Alarm correlation



# PVFS2 Architecture

