SFIO progress on Swiss-Tx

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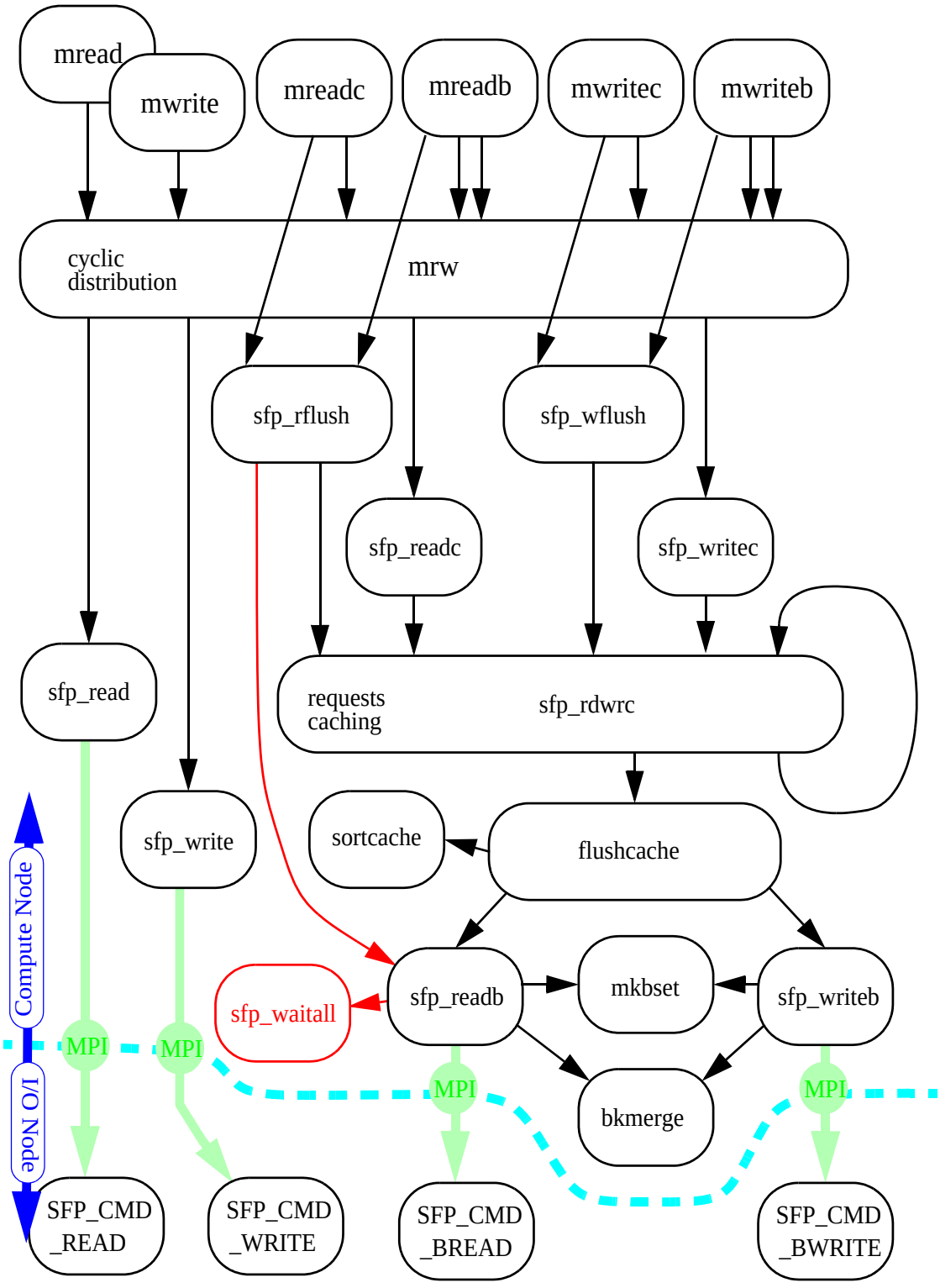
- SFIO library architecture
- SFIO on top of MPICH and on top of MPIFCI, performance on T1
- performance of SFIO on top of MPIFCI on T1. Very large files, no cache effect.
- Swiss-T1's topology. Possible influence to the SFIO performance
- Conclusion
- Future work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mwrite
mreadc
mreadb
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sfp_readc
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sfp_read
requests
caching
sfp_rdwrc
sfp_write
sortcache
flushcache
Compute Node
I/O Node
sfp_waitall
sfp_readb
mkbset
sfp_writeb
MPI
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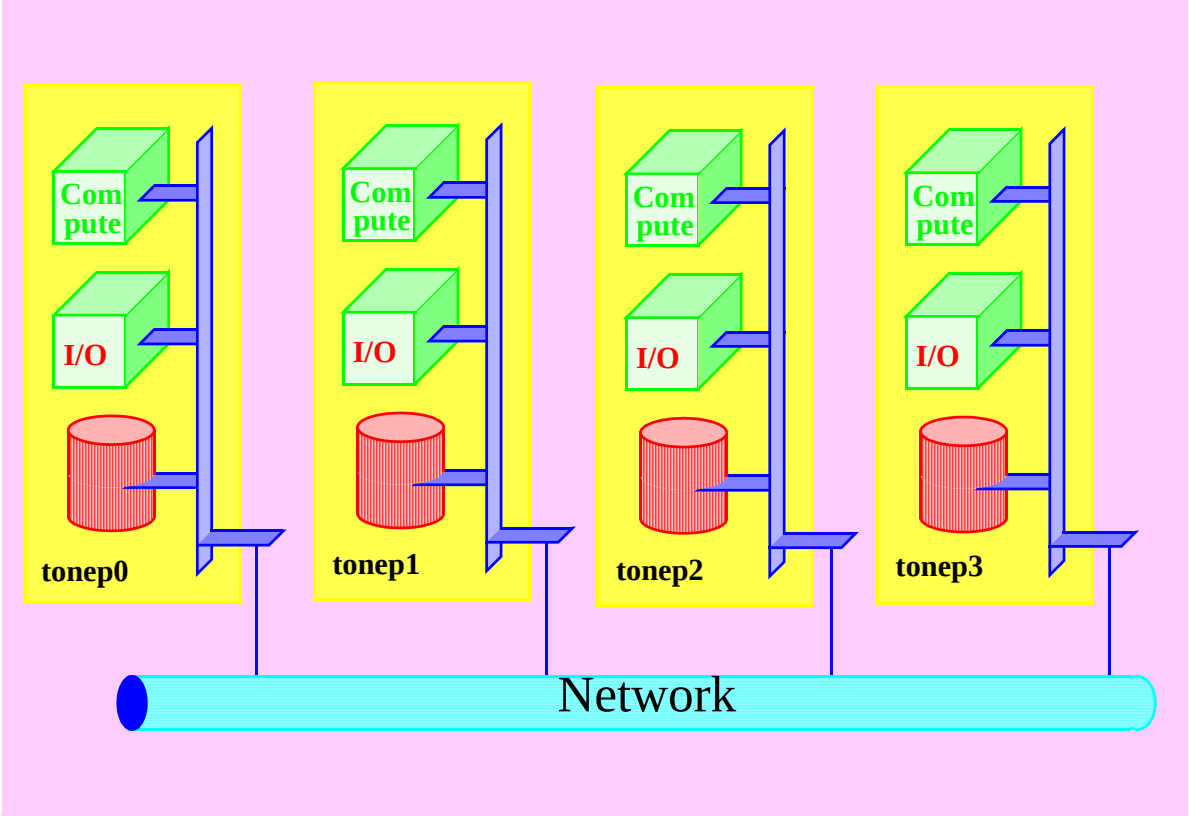
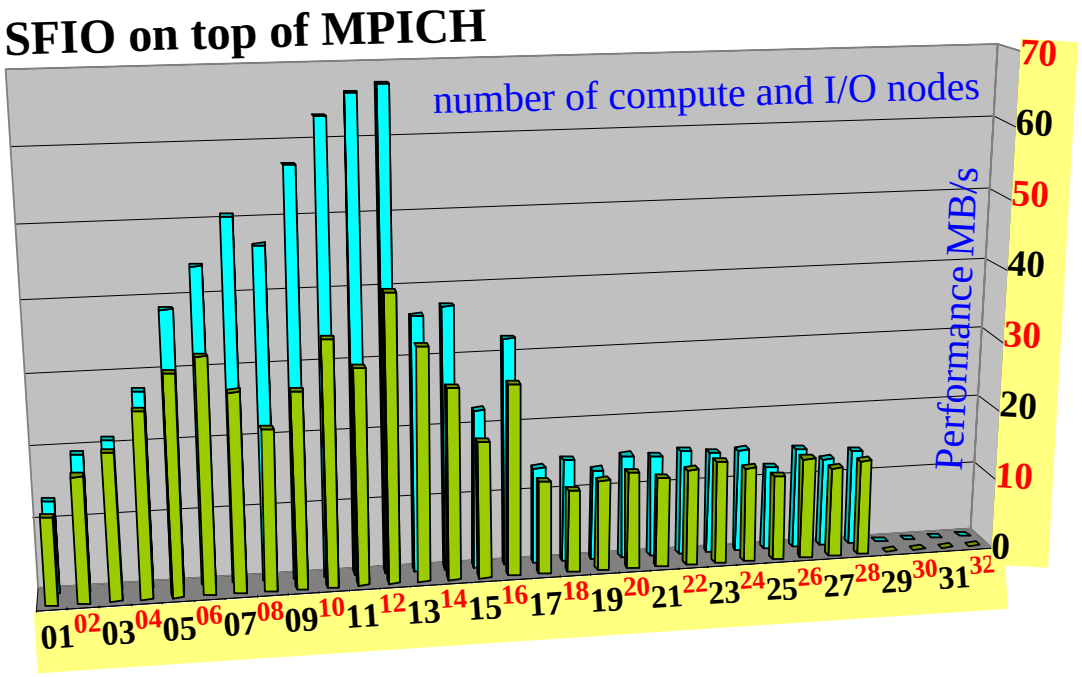


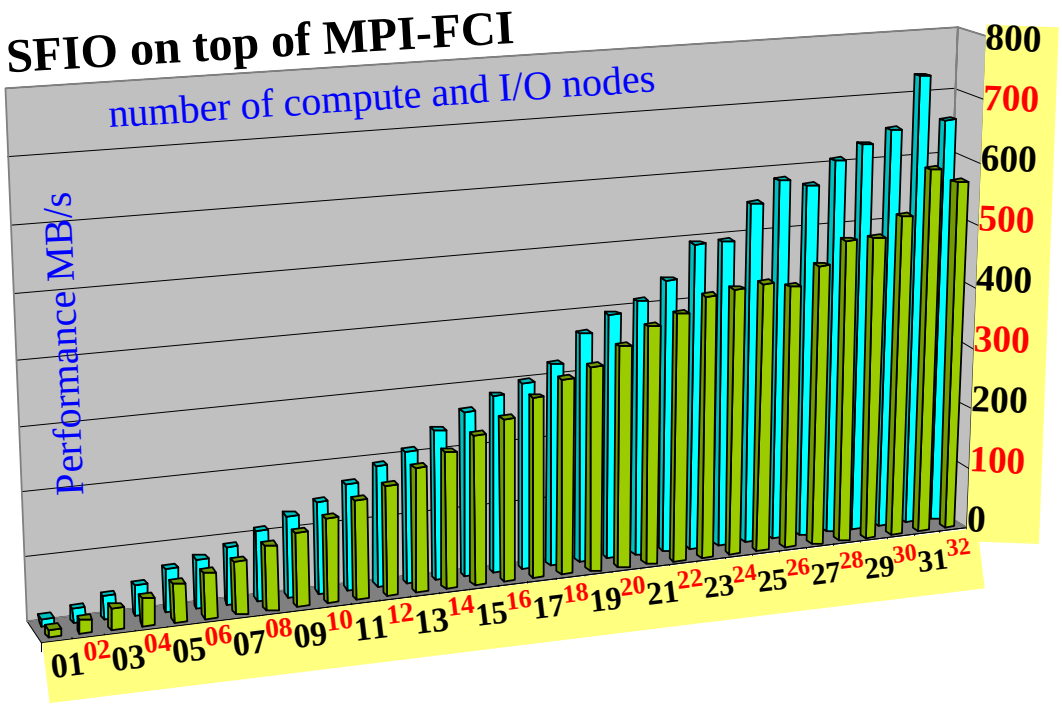
- SFIO All-to-All concurent write access from all compute nodes to all I/O nodes

- Global File size is 2000MByte for MPICH and MPIFCI.

- Stripe unit size is 200Byte only

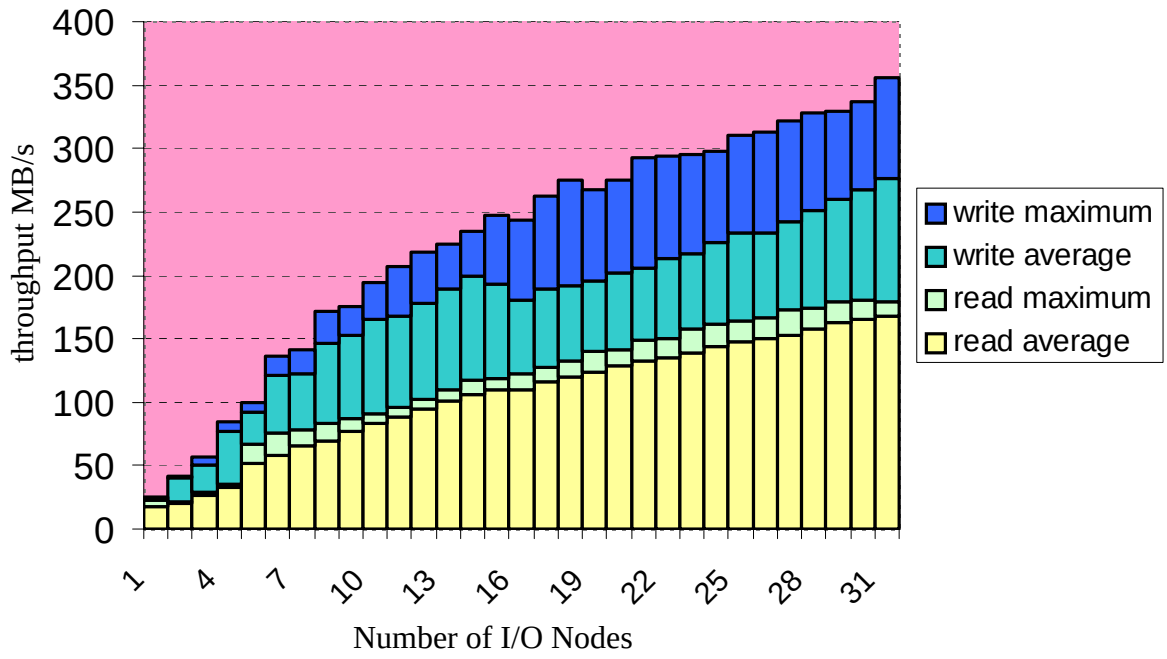
SFIO all-to-all I/O performance on Swiss-T1's Fast Ethernet and Tnet



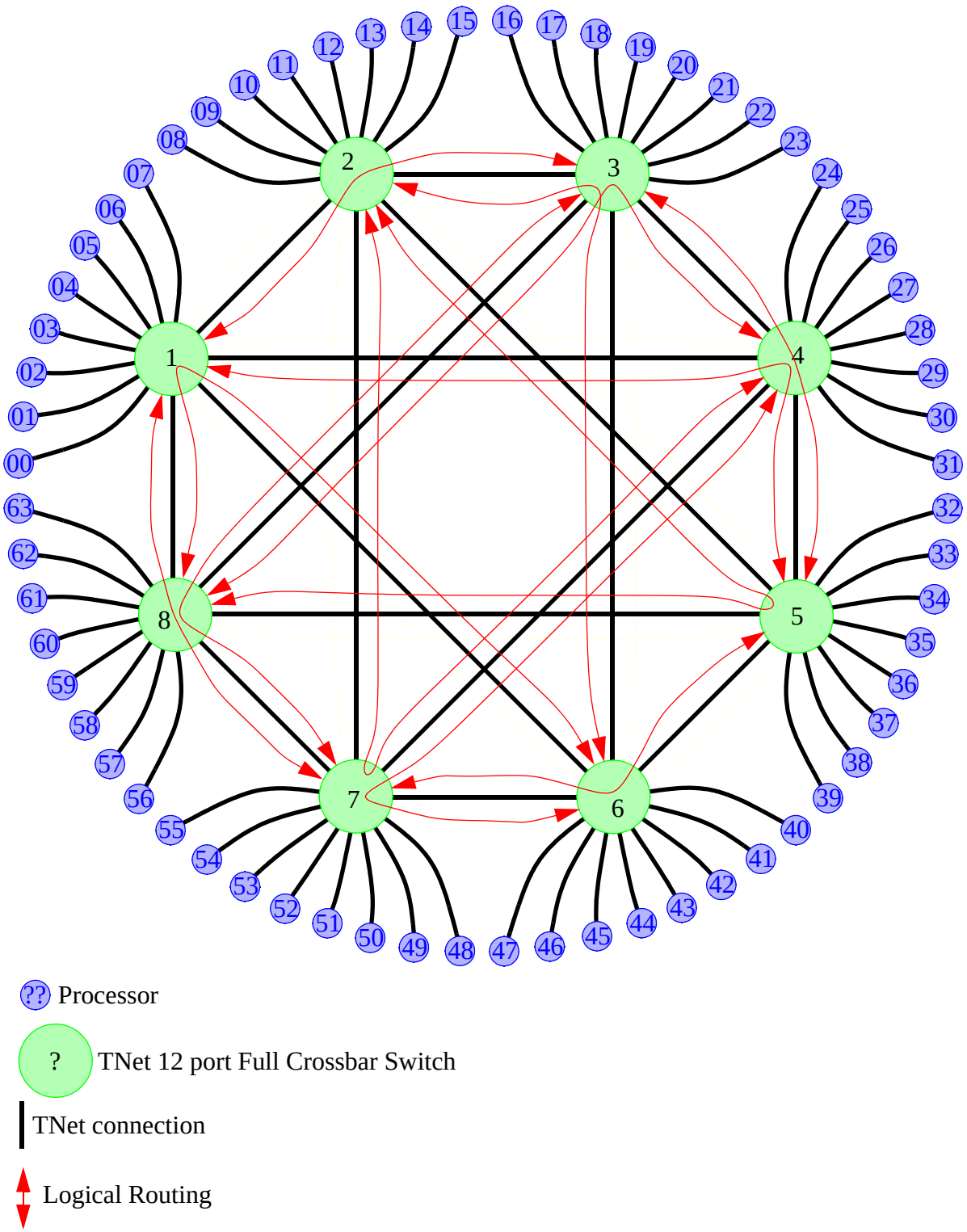


- Superlinear speedup of SFIO/FCI due to augmentation of cache effect when increasing the number of I/O nodes.

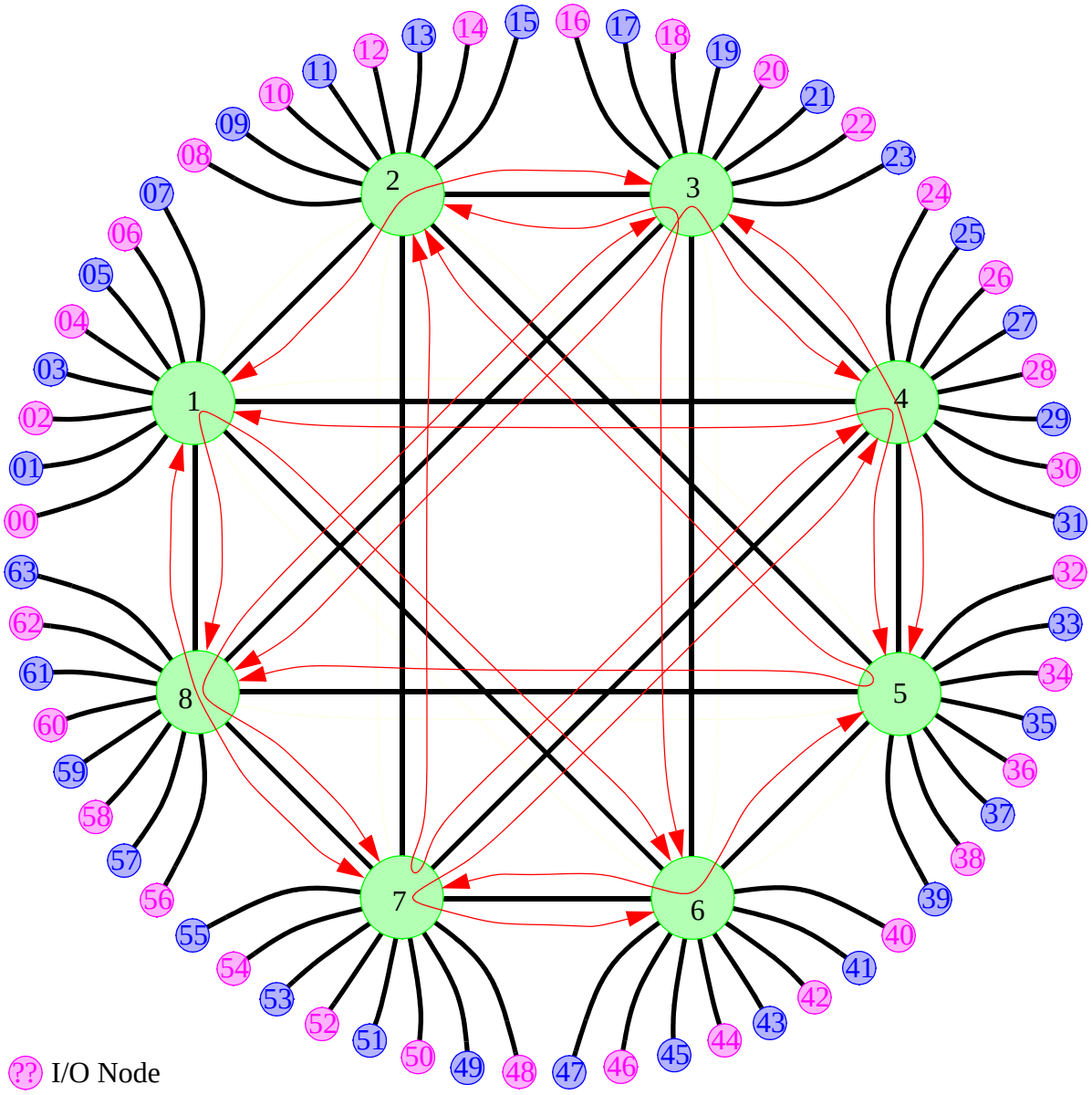
SFIO All-to-all performance on T1.
(1GB-31GB file size, 200Byte chunk, 53 measurements)



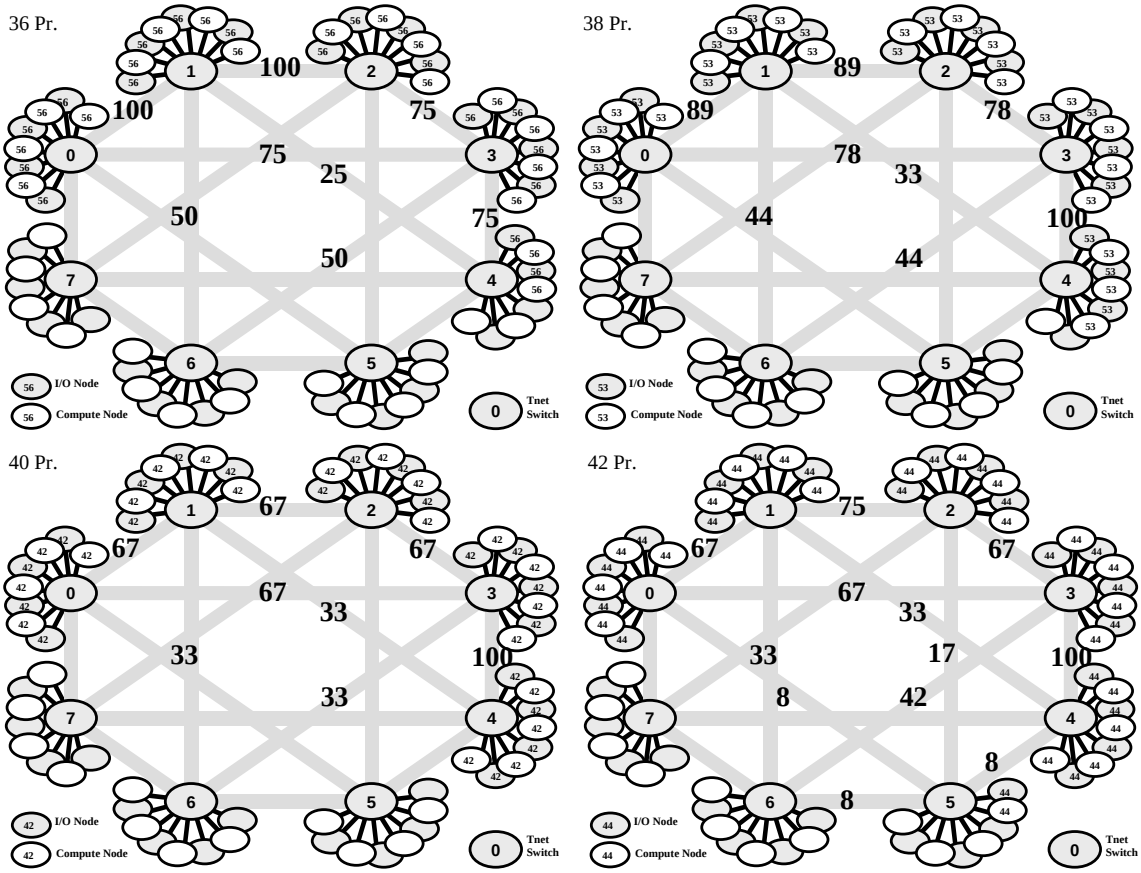
- To avoid the cache effect the total size of SFIO files is increasing when the number of I/O nodes grows.



Swiss-T1 TNet interconnection and routing topology

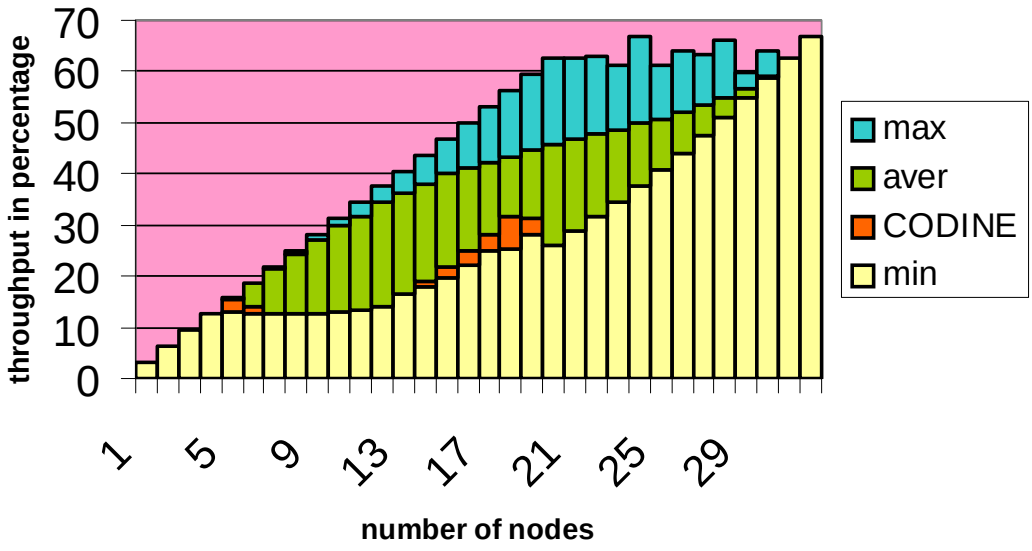


Swiss-T1 SFIO over TNet topology



connection loads

Theoretical throughput of the Swiss-T1 network as a percentage of ideal throughput of fully crossbared switch. 1008000 montecarlo events of parallel simulation. The min represent the worst topology and the max the best



Theoretical throughput

Conclusion

- SFIO is portable, highly scalable, and ready for the distribution.

Future work

- SFIO performance benchmarking on the large supercomputer of Sandia National Laboratory.

- Performance measurements of MPI-I/O interfaced to SFIO through MPICH/ADIO.

- Possibly, creation of a portable MPI-I/O interface library to SFIO.