Freie Universität Berlin

Configuring a Self-Organized Semantic Storage

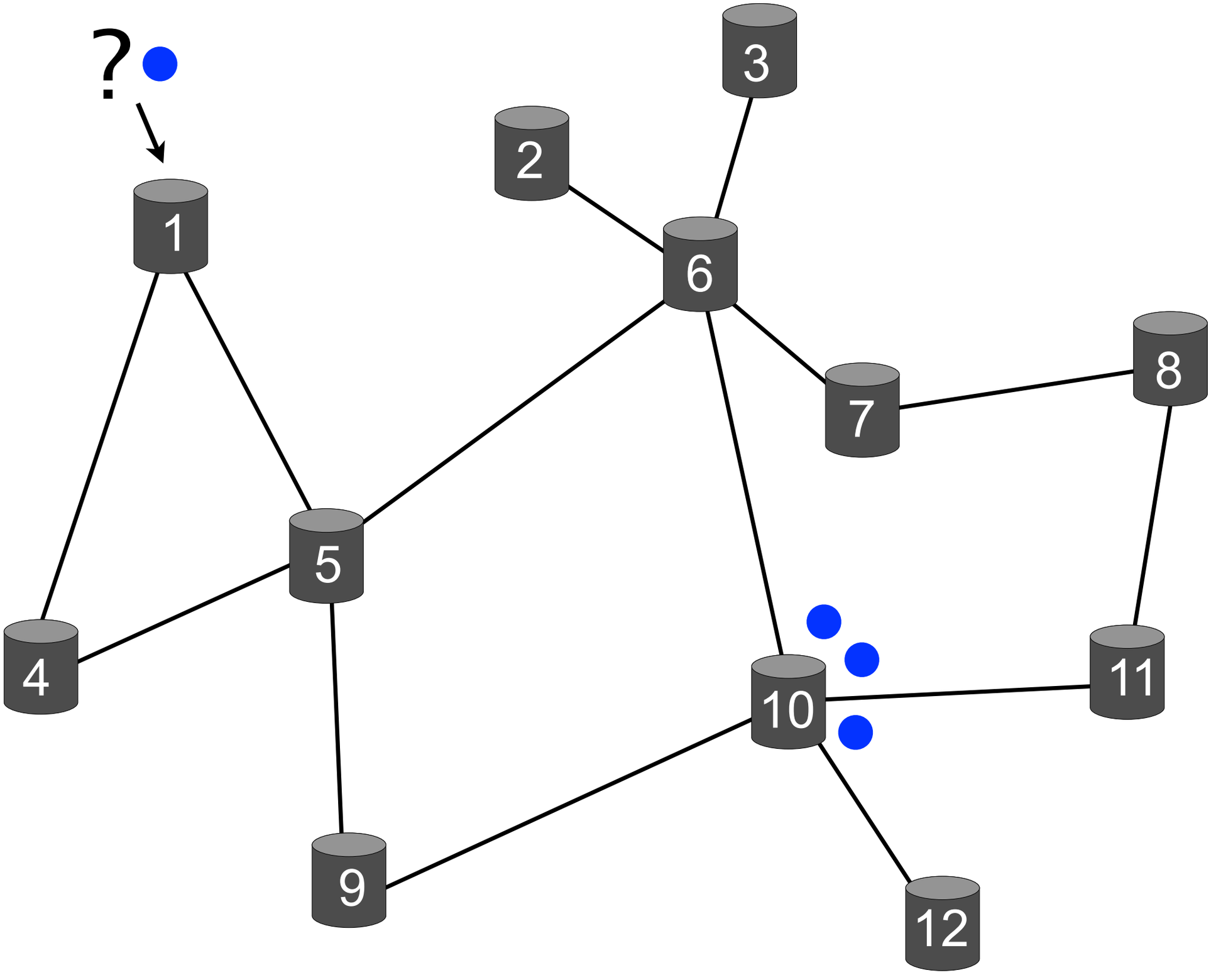
Hannes Mühleisen, Tilman Walther, Anne Augustin, Marko Harasic & Robert Tolksdorf

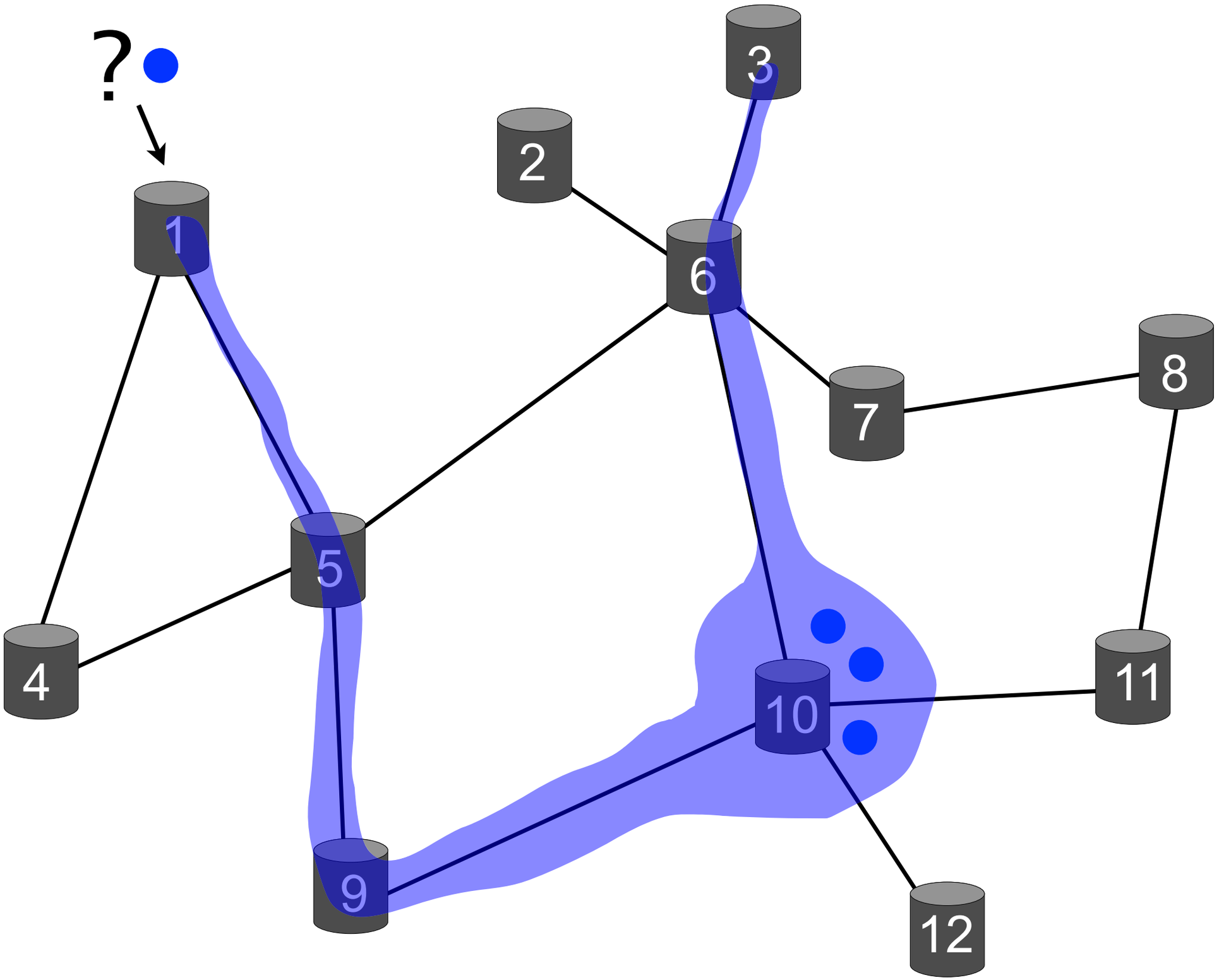
Trade-Offs in Storage

	Scalability	Adaptability	Robustness	Correctness
Stand-Alone	low	**high**	low	**high**
Federated	**high**	**high**	fair	**high**
Distributed	**high**	**fair**	fair	**high**
Swarm-based	**high**	**high**	**high**	fair

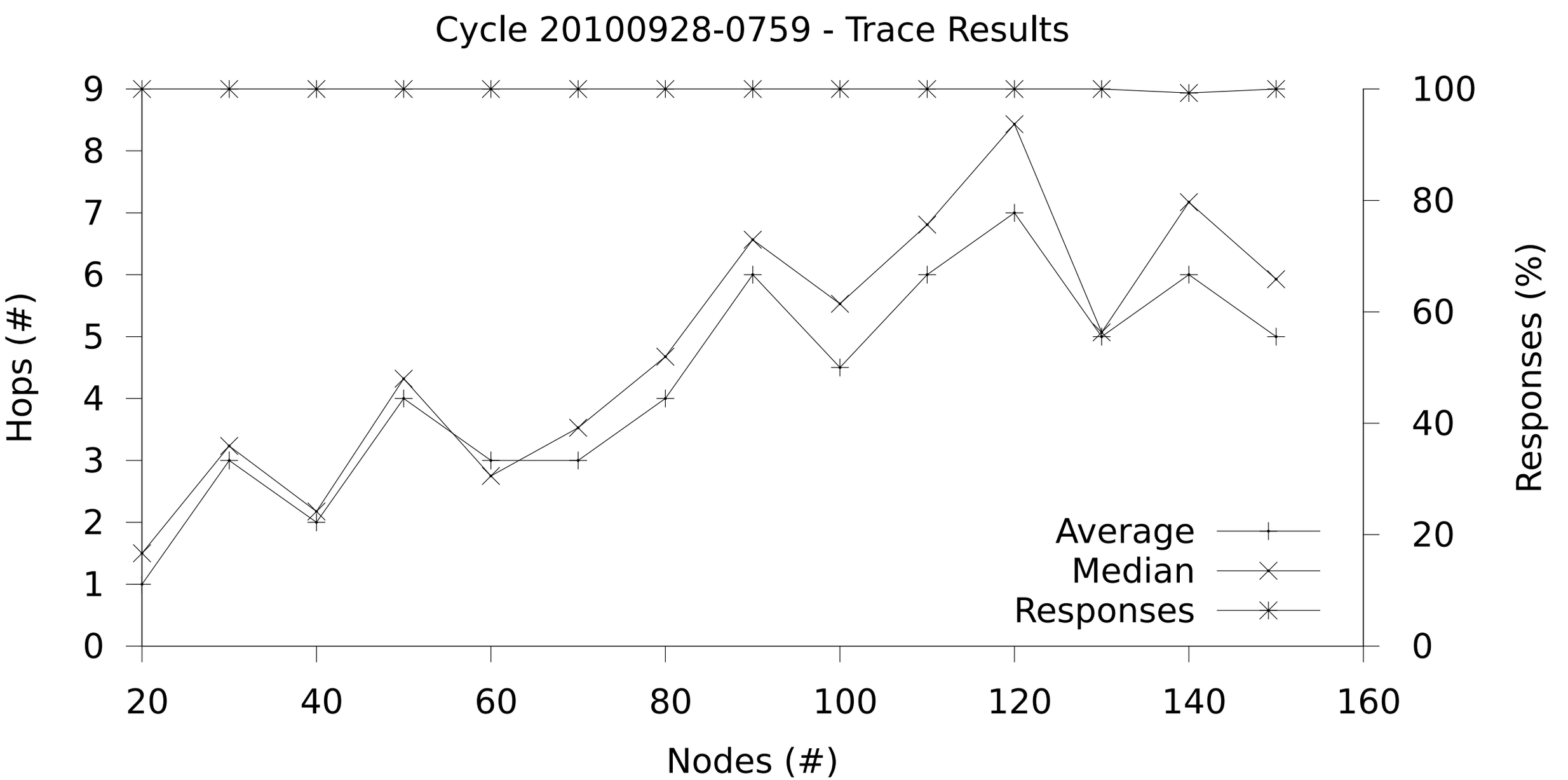
Trade-Offs in Storage

	Scalability	Adaptability	Robustness	Correctness
Stand-Alone	low	**high**	low	**high**
Federated	**high**	**high**	fair	**high**
Distributed	**high**	**fair**	fair	**high**
Swarm-based	**high**	**high**	**high**	fair

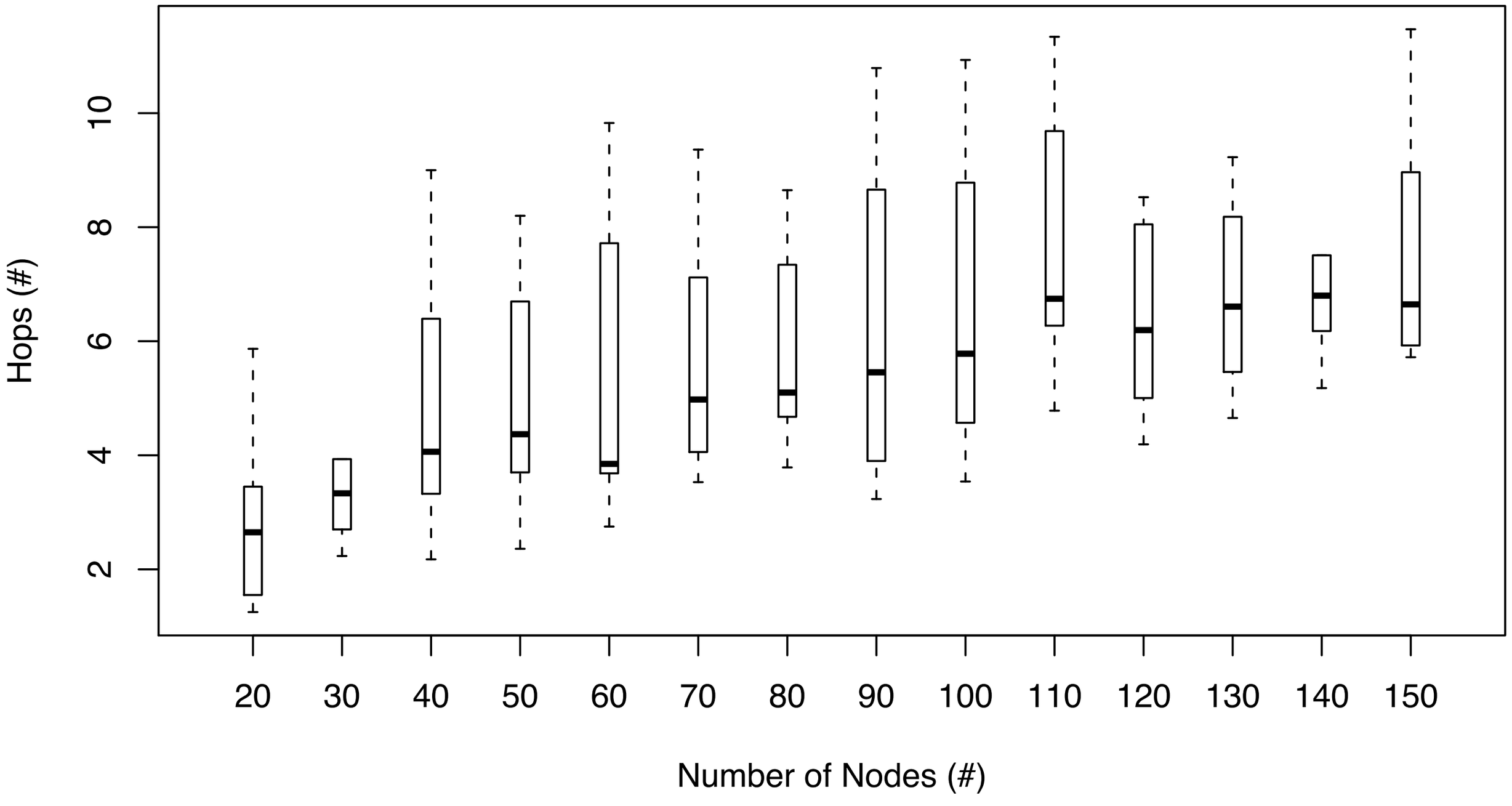

?
1
2
3
4
5
6
7
8
9
10
11
12


?
1
2
3
4
5
6
7
8
9
10
11
12

Read Hop Count – 1 Run



Read Hop Count – 10 Runs



Number of Steps?

Number of Steps?

- Operations are terminated after a certain number of steps has been taken

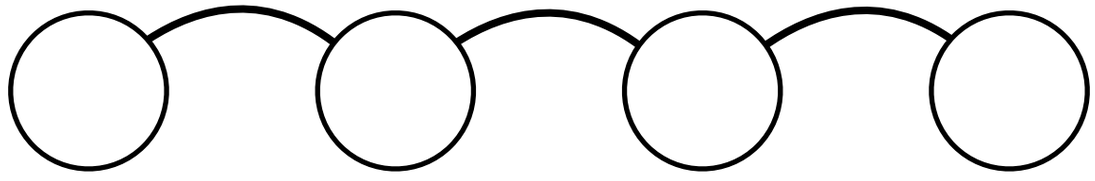
Number of Steps?

- Operations are terminated after a certain number of steps has been taken
- How should this limit been set, which impact is expected?

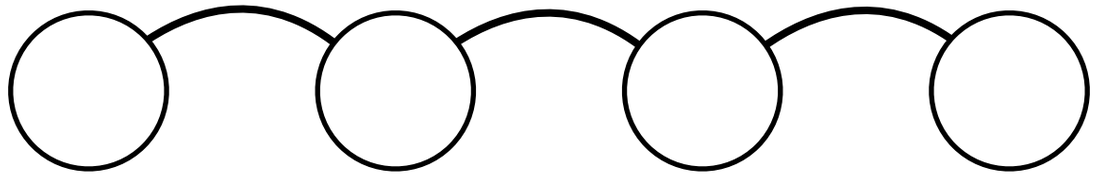
Number of Steps?

- Operations are terminated after a certain number of steps has been taken
- How should this limit been set, which impact is expected?
- Observation:
  A higher value can lead to better performance (Doh!)

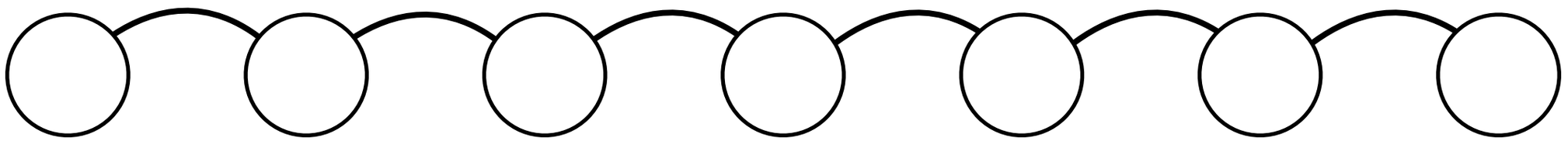
Hop Count Limit?



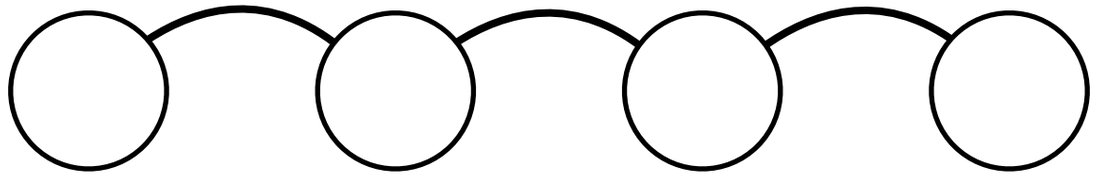
Hop Count Limit?



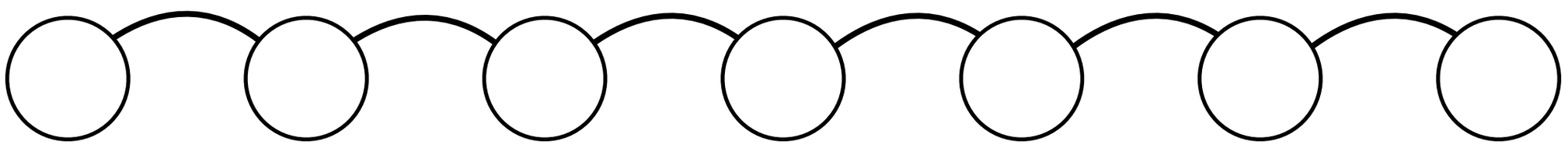
VS.



Hop Count Limit?



vs.



better!

Neighbor Limit?

Neighbor Limit?

- Each node is allowed to have a certain amount of neighbor nodes

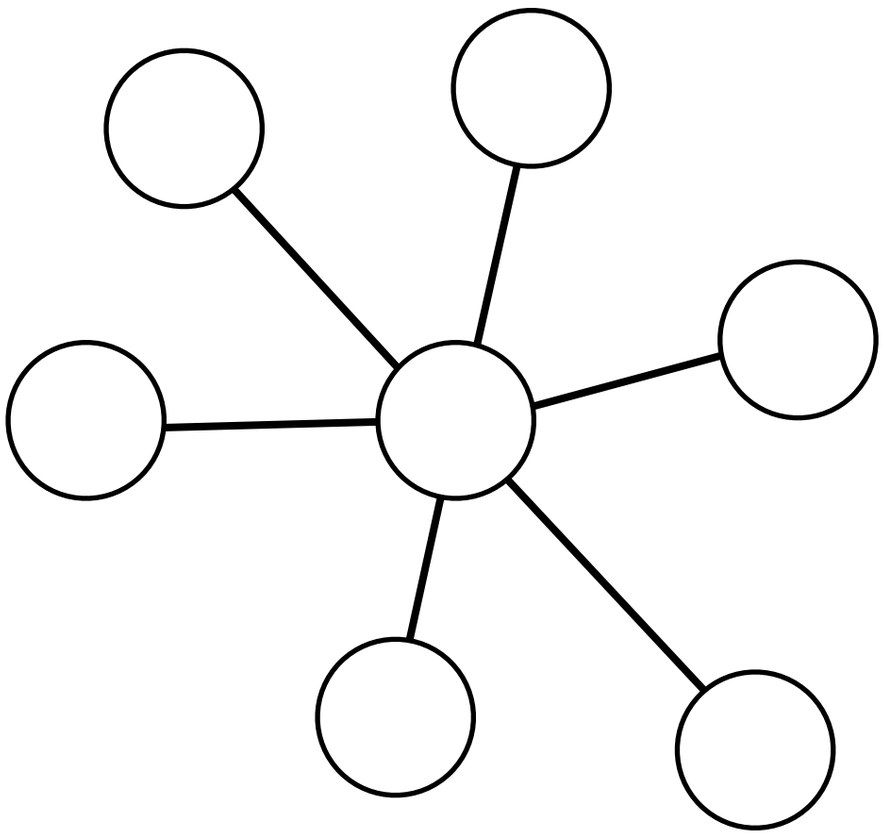
Neighbor Limit?

- Each node is allowed to have a certain amount of neighbor nodes
- How should this limit been set, which impact is expected?

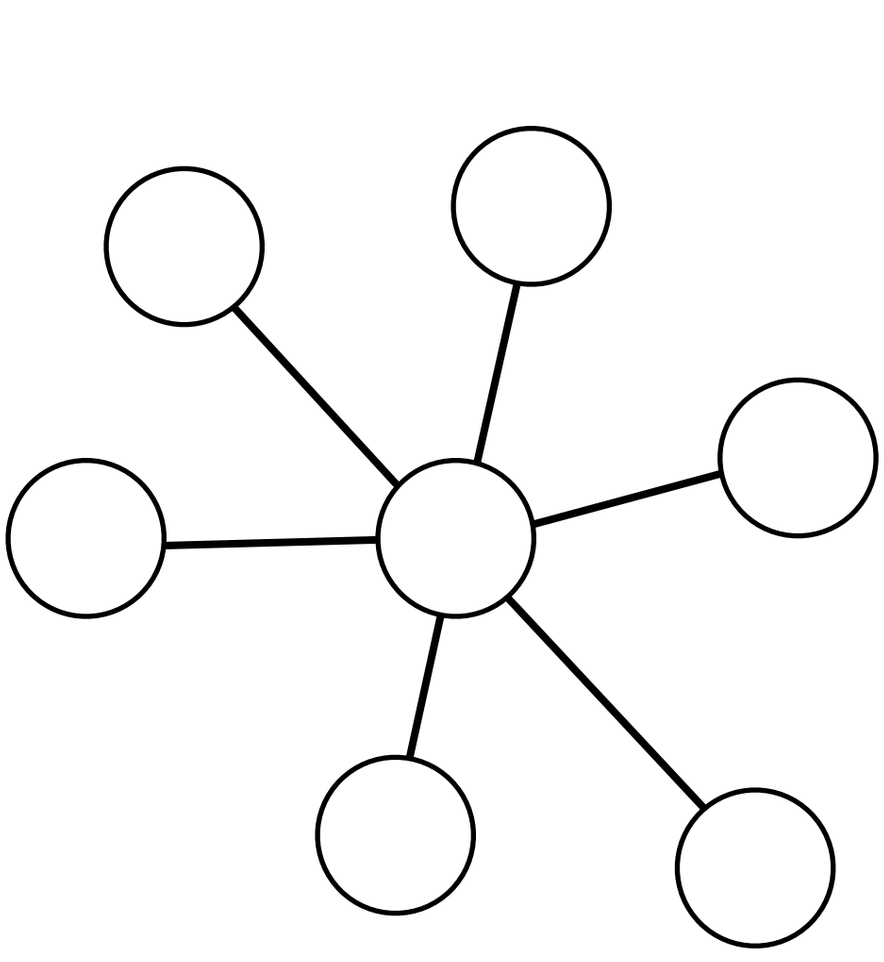
Neighbor Limit?

- Each node is allowed to have a certain amount of neighbor nodes
- How should this limit been set, which impact is expected?
- Observation:
  A higher value can lead to performance issues

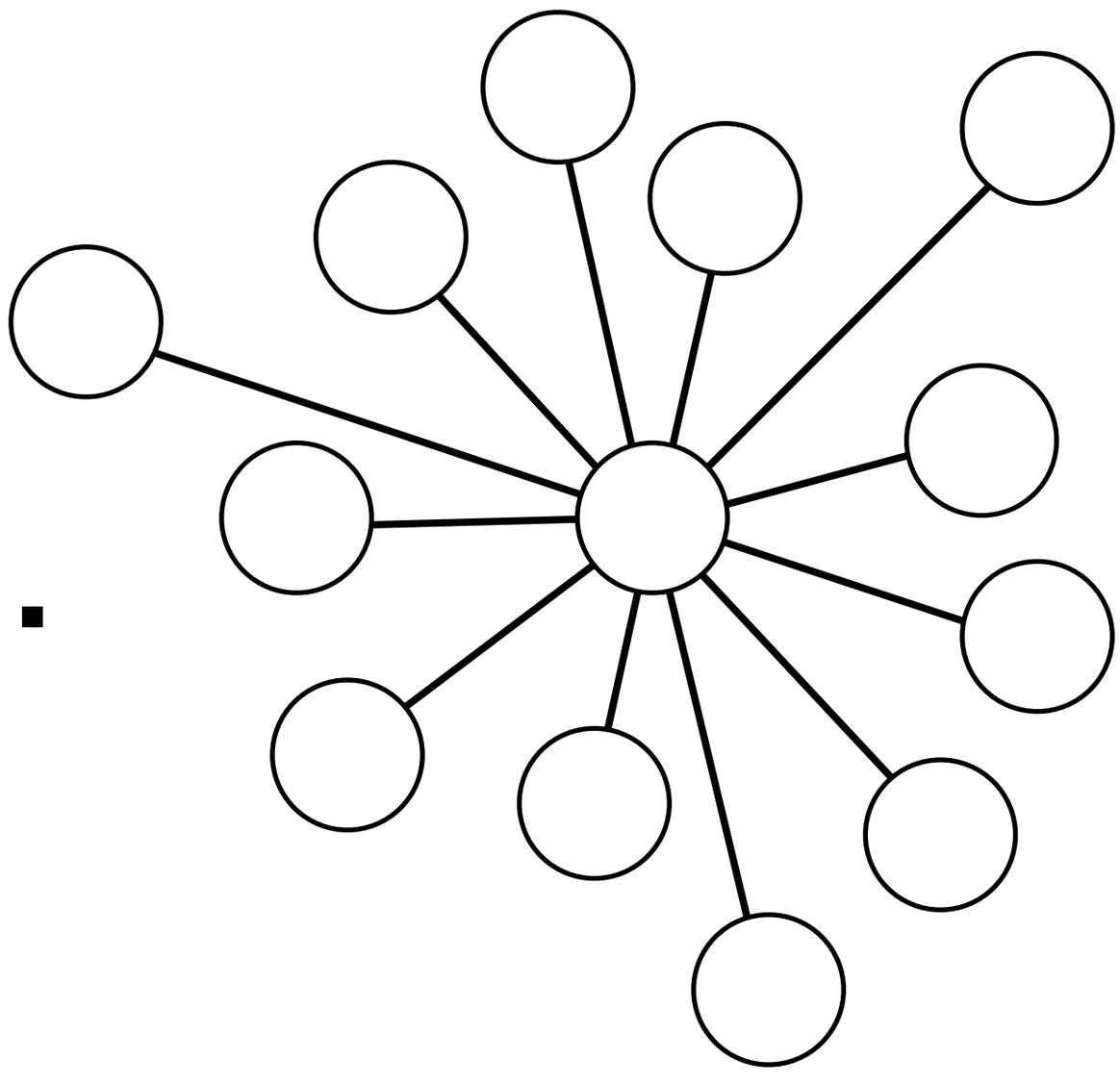
Neighbor Limit?



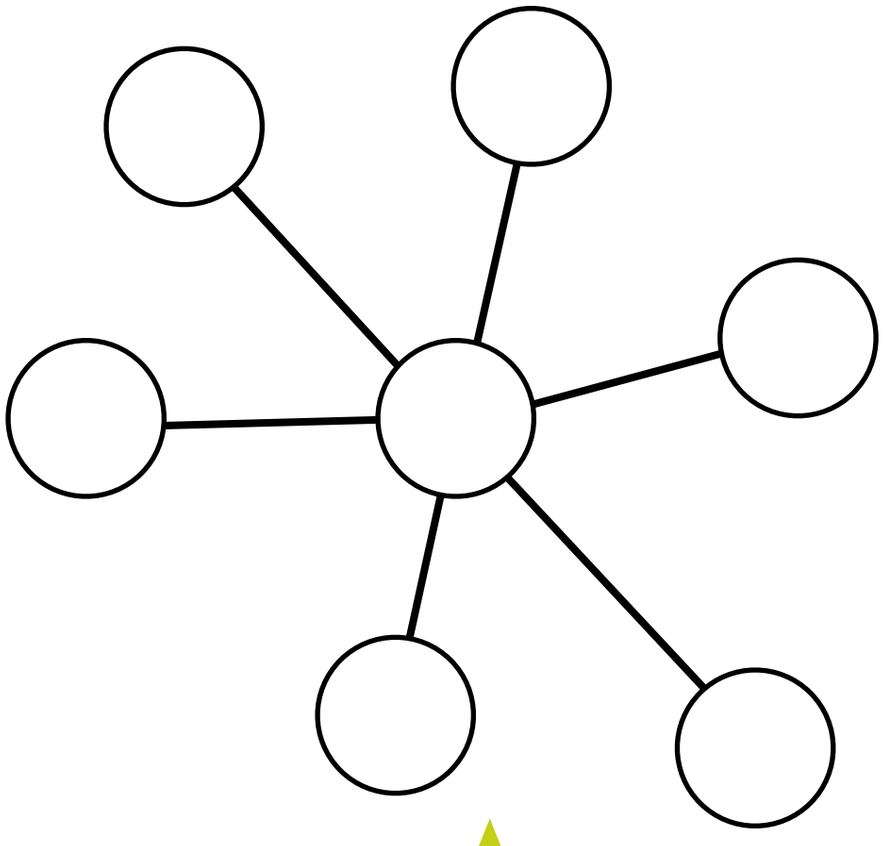
Neighbor Limit?



vs.

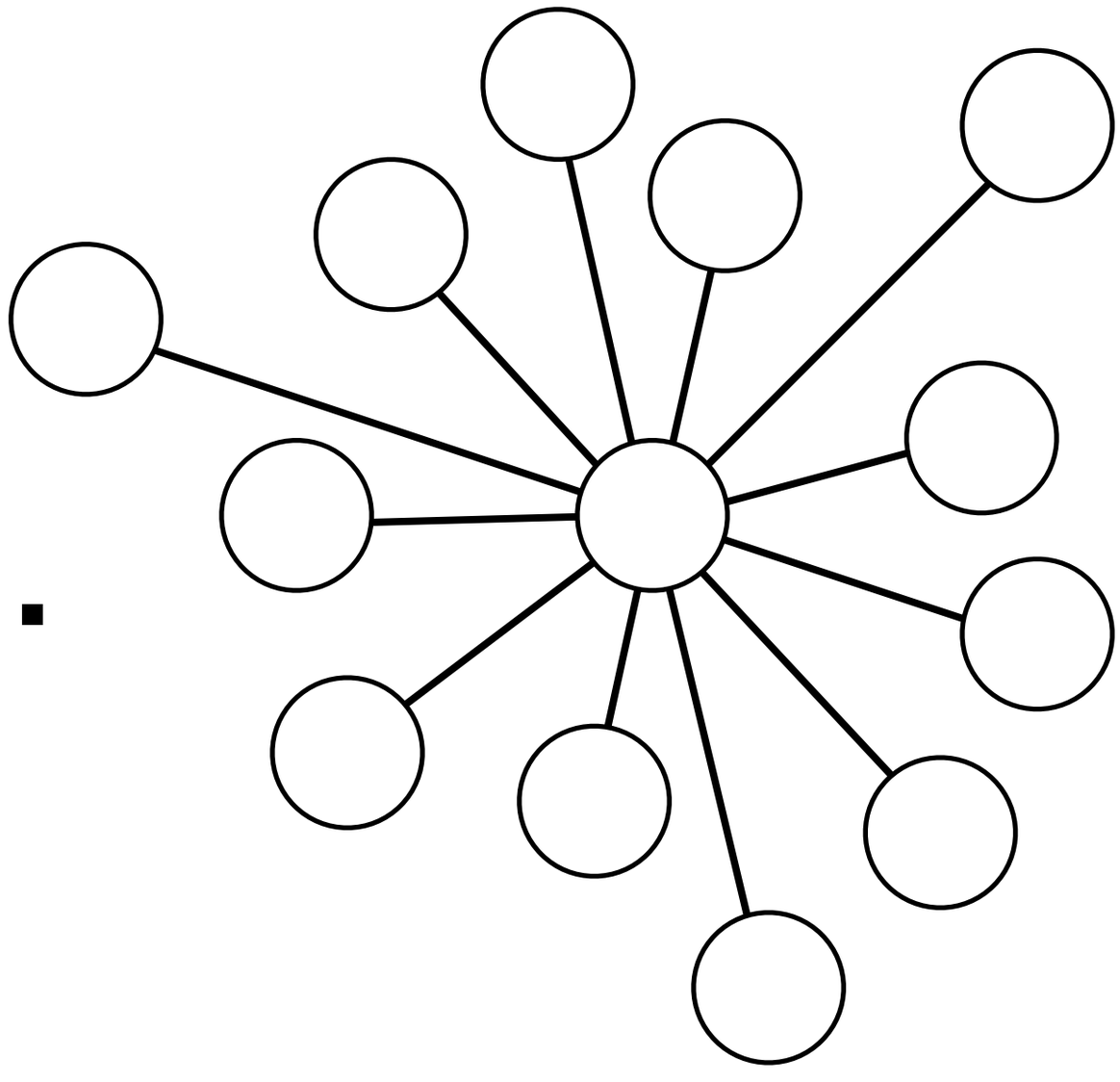


Neighbor Limit?

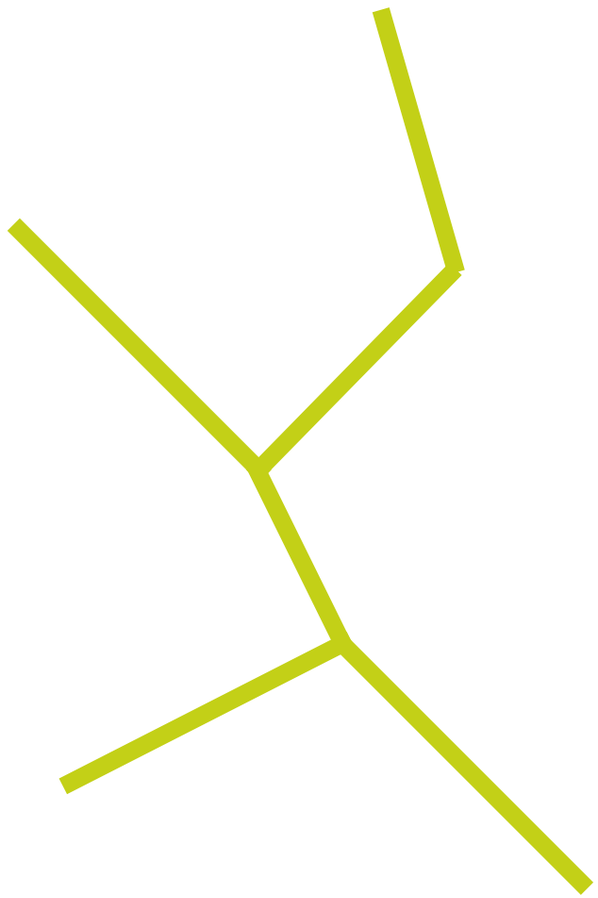


better!

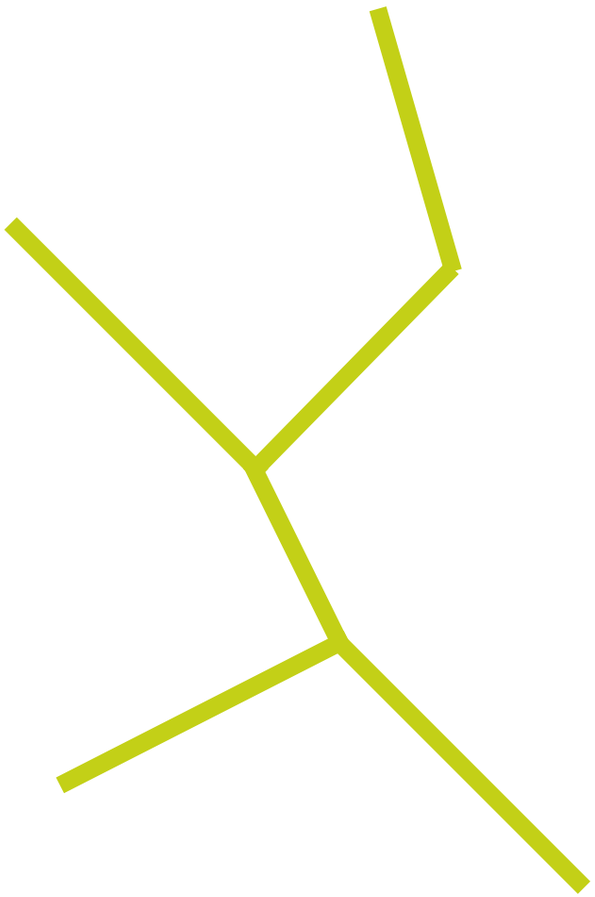
vs.



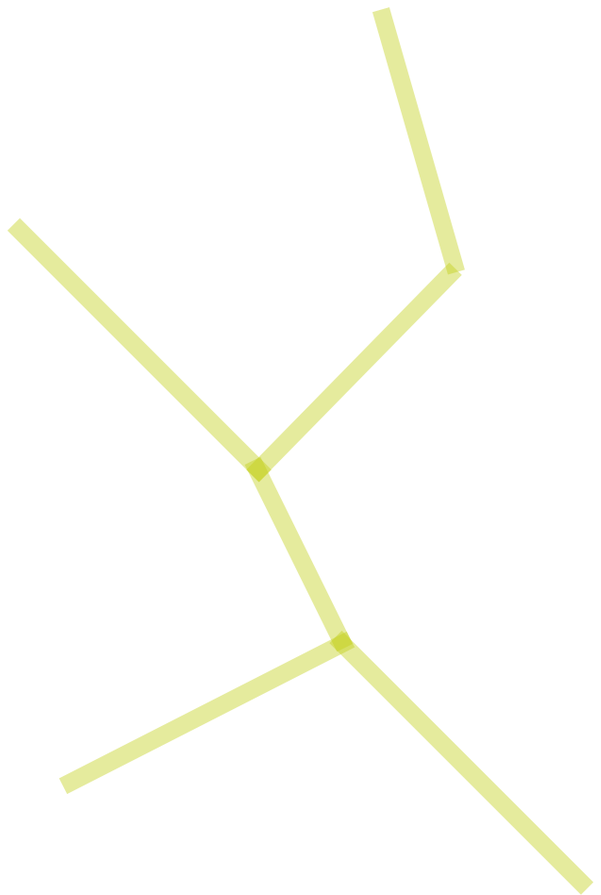
Decay Rate?



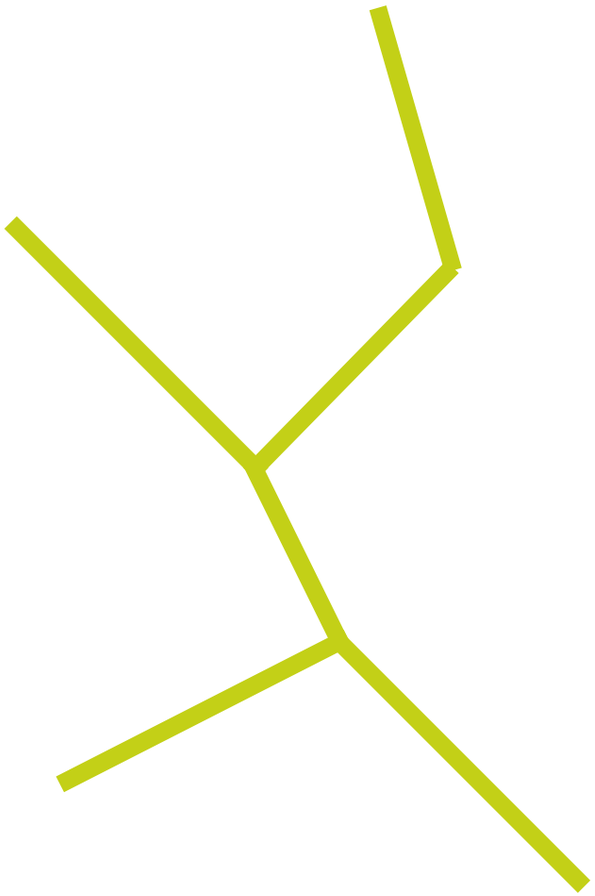
Decay Rate?



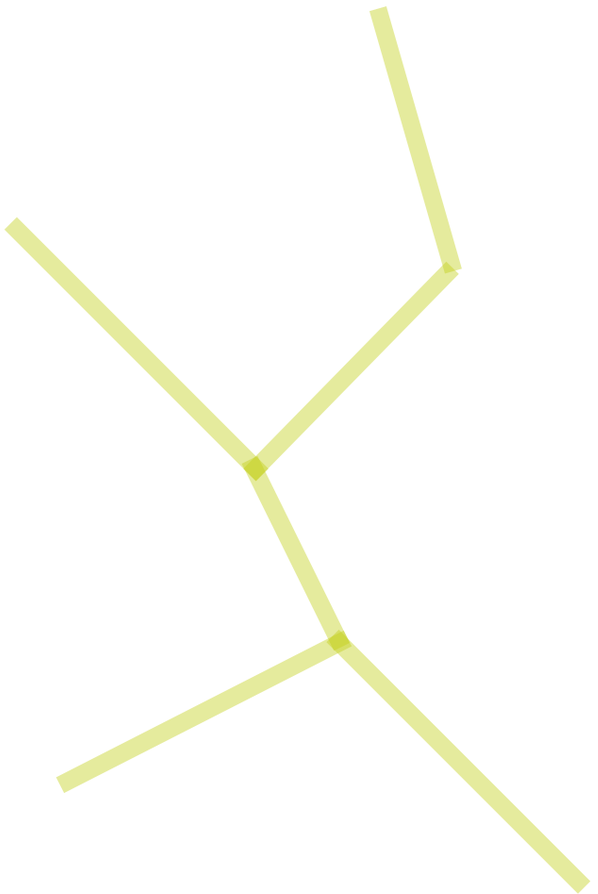
vs.



Decay Rate?



vs.



better!

Conclusion

Conclusion

- Swarm-Based Approaches can provide scalability for a distributed storage service

Conclusion

- Swarm-Based Approaches can provide scalability for a distributed storage service
- Tuning the various parameters is a complex challenge, which requires further work

Conclusion

- Swarm-Based Approaches can provide scalability for a distributed storage service
- Tuning the various parameters is a complex challenge, which requires further work
- Thank you!

Conclusion

Ants search triples for you, if you treat them right...