Saving energy with Xen

Research Project

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Research Project

- Introduction
- Application Types
- Migration Strategies
- Measurements
- Conclusion

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Research Questions

What are the different types of systems and (how) will their migration strategy differ?

What is the amount of energy saved for a certain configuration, is it useful to implement this system in existing clusters?

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- Memory Intensive
- CPU Intensive
- HDD Intensive
- Network Intensive
- Hardware Specific

Memory Intensive

- Large in- memory databases
- Graphical applications
- Applications with a large dataset

CPU Intensive

- Applications for heavy calculations
- Busy mailserver with spam filter

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HDD Intensive

- File server
- Newsgroup server
- Mail server
- Large database server

Network Intensive

- File server
- Newsgroup server
- Mail server

Hardware Specific

- Specialised networking hardware
- TV card
- Special graphics card
- Special clock source
- High speed network card

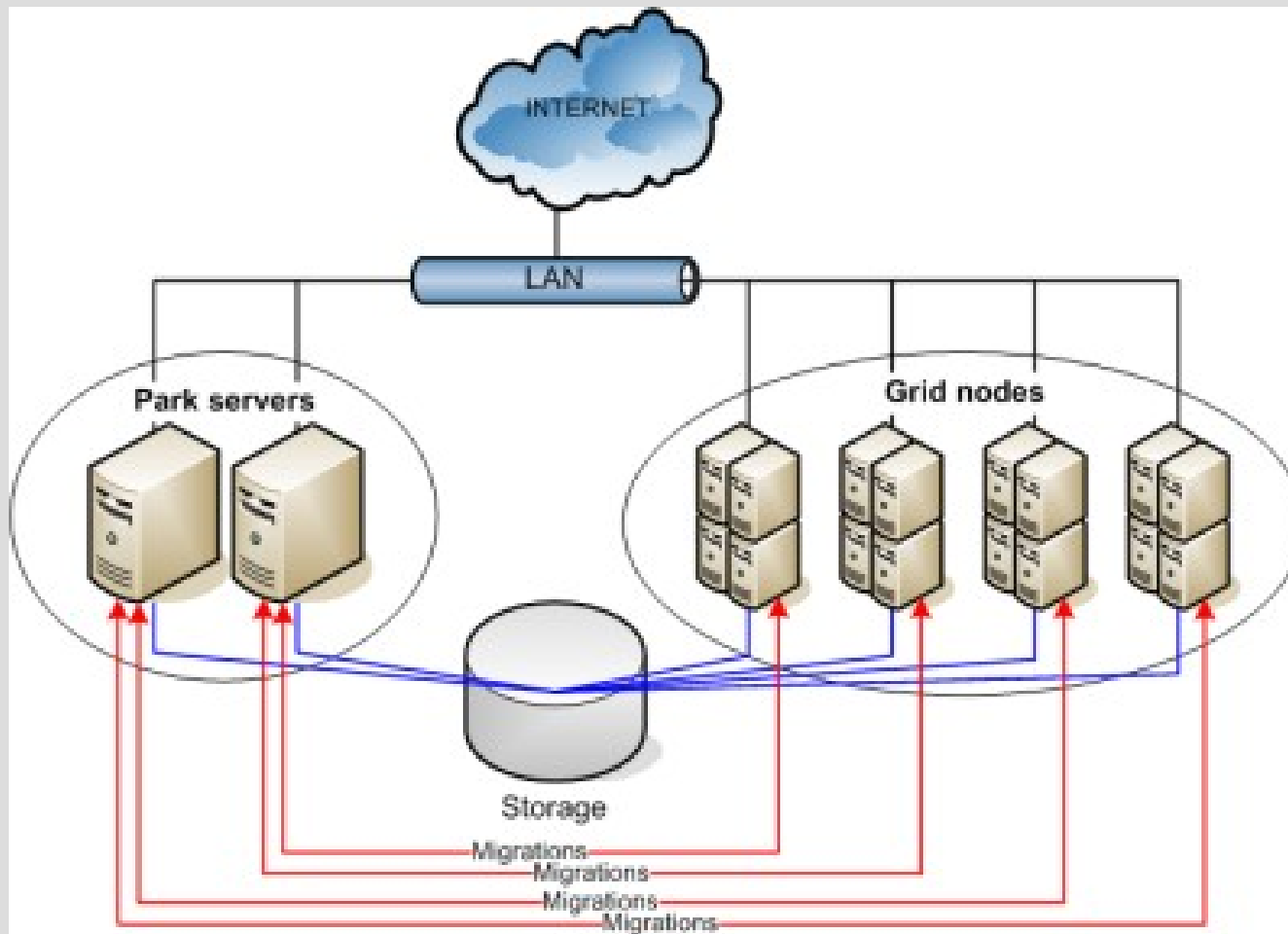# Saving energy with Xen

Migration Strategies (1/5)

- No migration
- Static migration
- Dynamic migration

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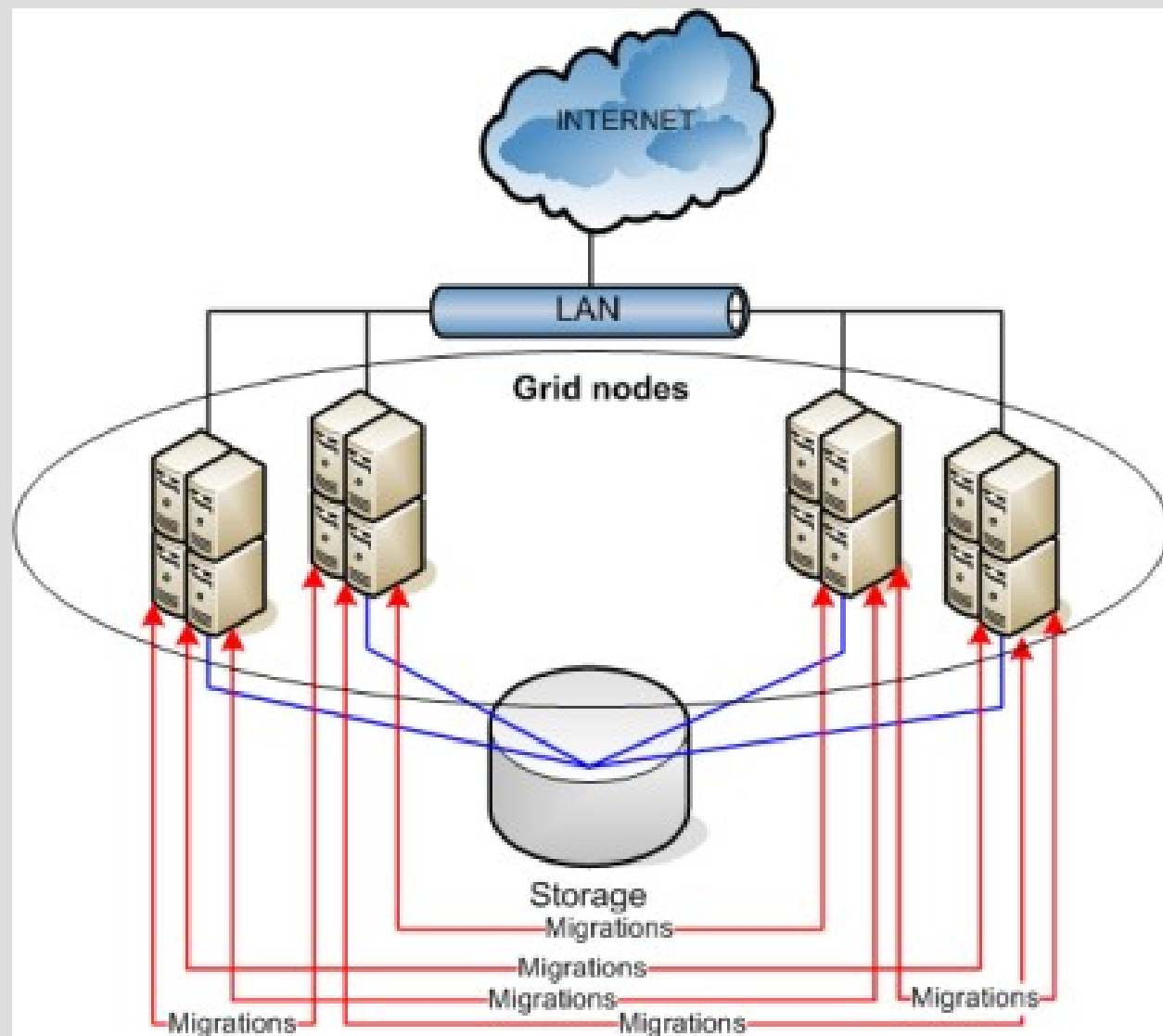
Static Migration

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Static Migration
- Scheduler
- Migration Administration Tool

Migration Strategies (4/ 5)

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Dynamic
Migration

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Dynamic Migration
- Scheduler
- Monitoring Tool
- Migration Administration Tool

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Simple calculation:
- 35 nodes
- 300 Watt each
- 70%idle
- 8760 hours (1 year)
- EUR 0.11 per 1kWh

(35 * 0.7 * 300 * 8760) / 1000 * 0.11 = EUR7082.46 per year

(Note that this formula will not tell you how much you save on cooling.)

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Conclusion