



Scalable Resource Annotation in Peer-to-Peer Grids

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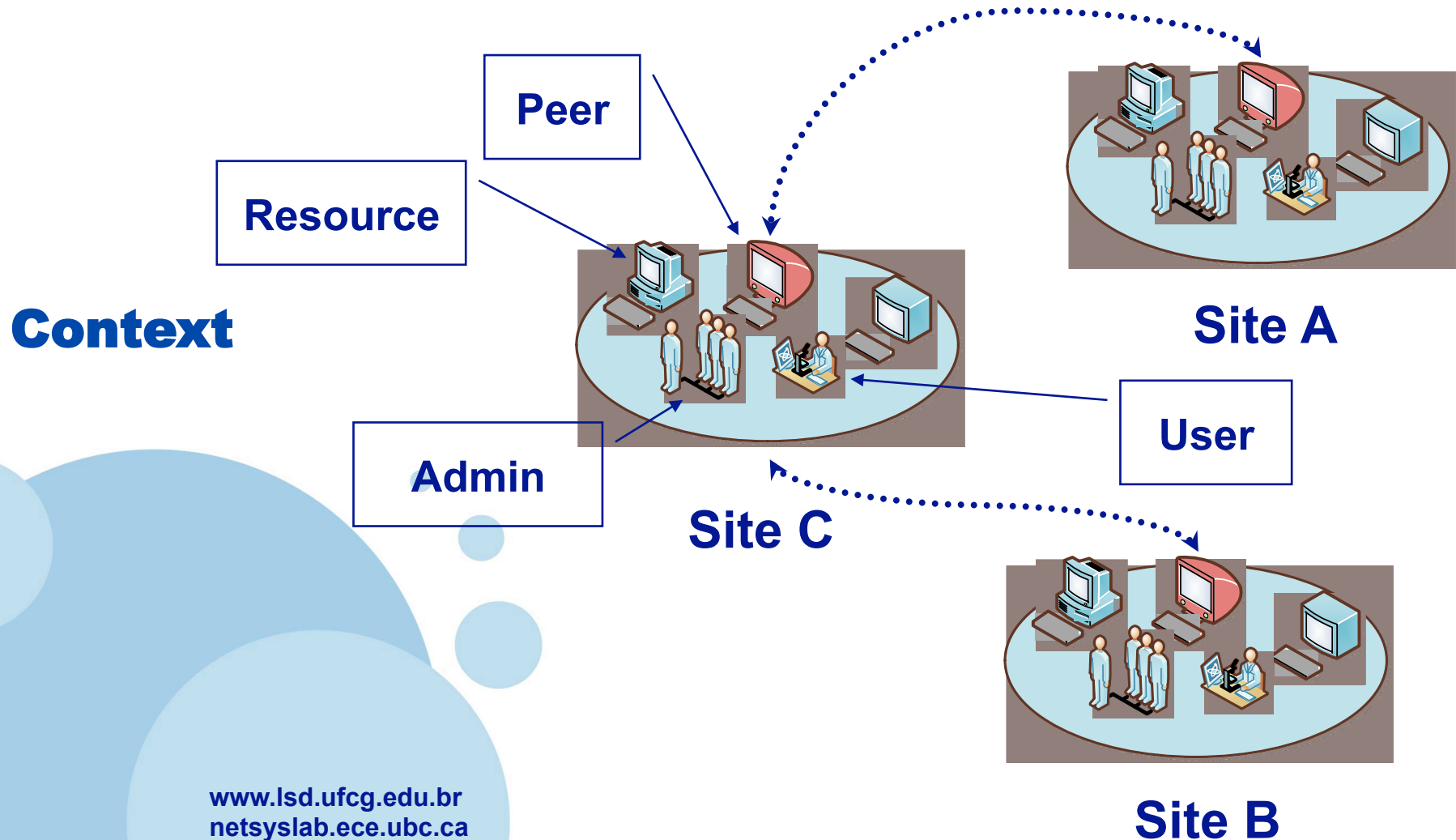
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A Peer-to-Peer Grid

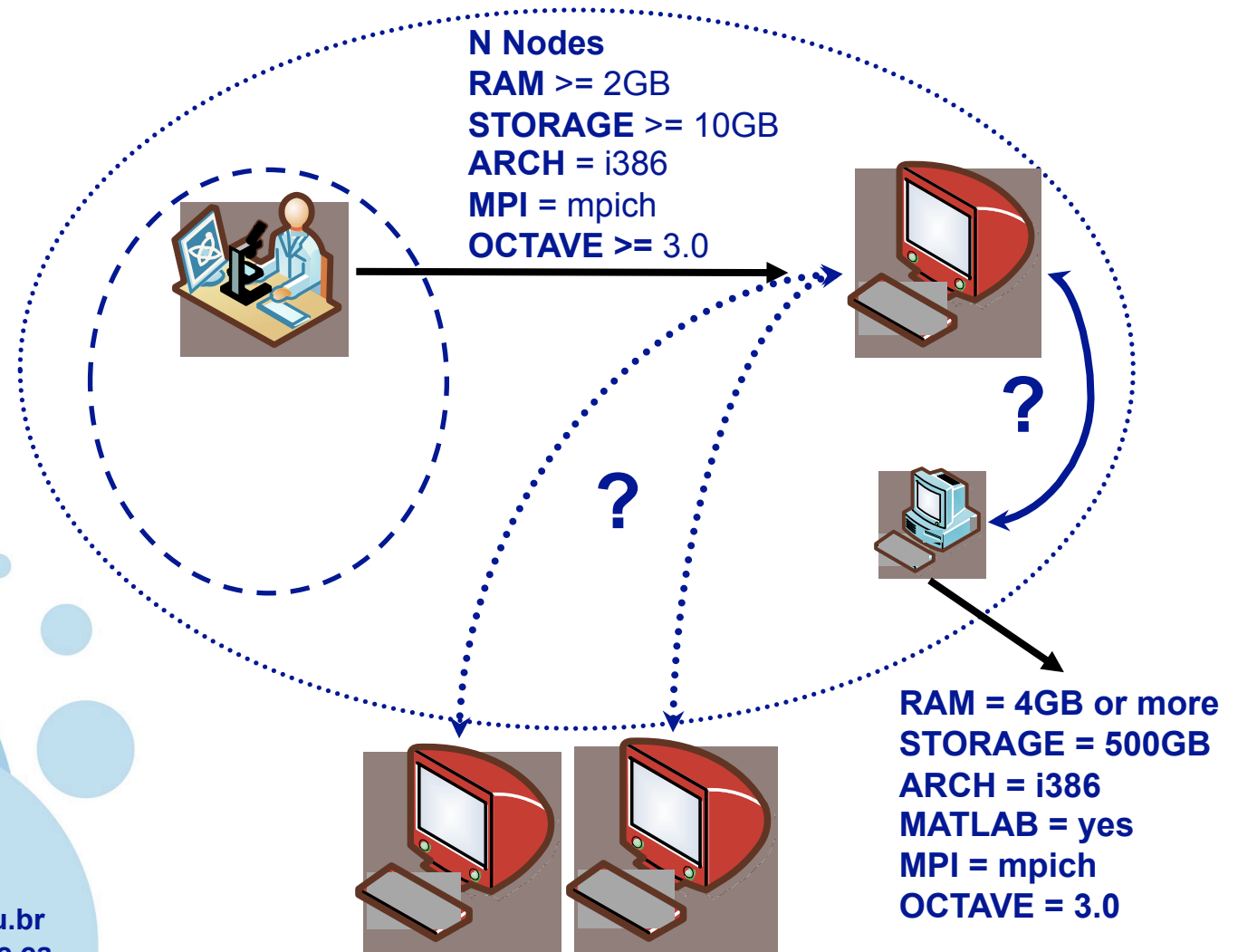


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Requesting Resources – Case I

Context



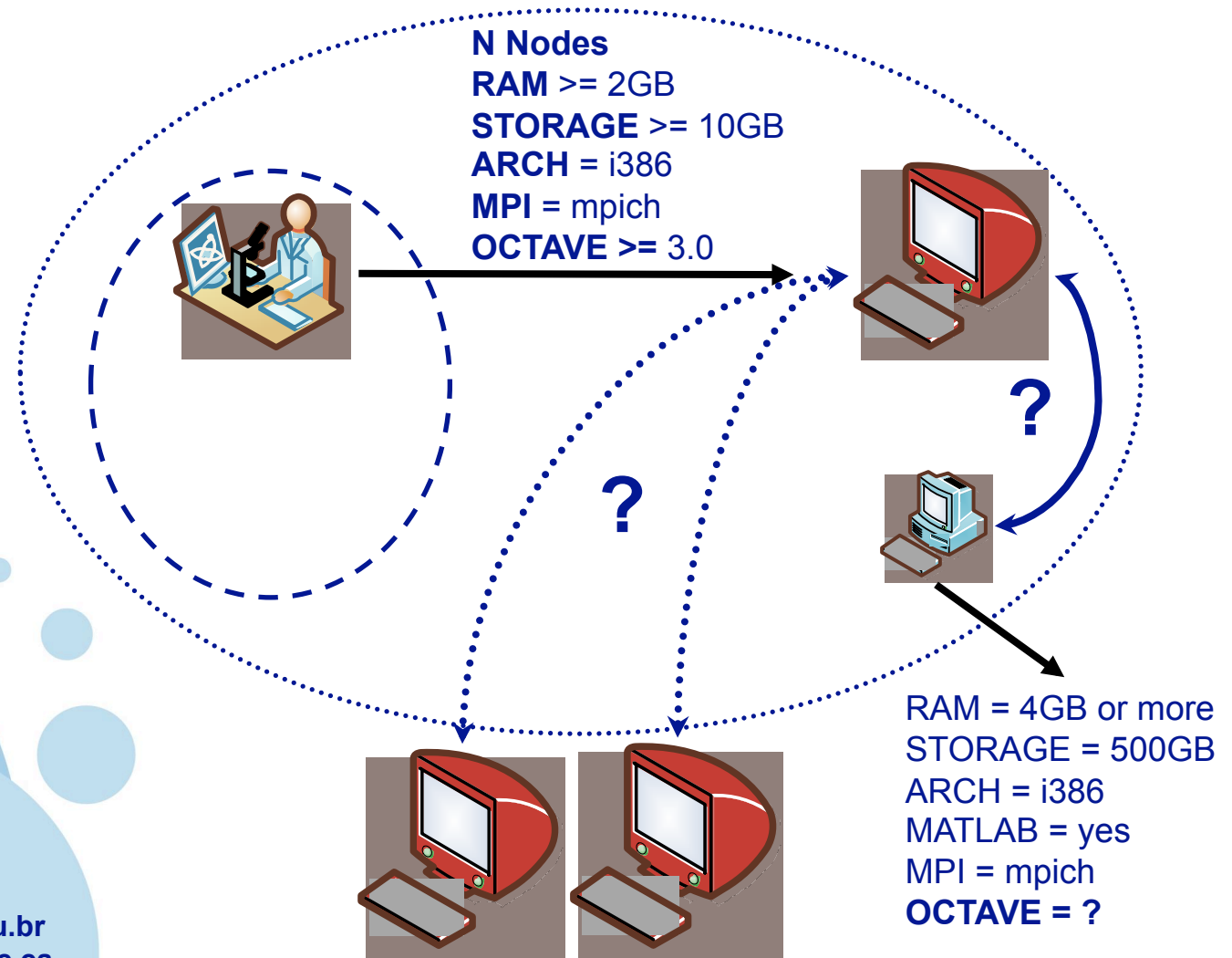
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Requesting Resources – Case II

Low Resource Utilization and Low User Utility

Context



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Resource Annotation

- User requirements and resource attributes change over time
 - Libraries and systems are constantly updated
 - System configurations change
 - Time to time users run different applications
- Centralizing the resource annotation on administrators is not scalable
- How to keep *resource attributes* up to date with user *application requirements*?

Problem

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Collaborative Annotation

- From collaborative tagging to P2P Grids
 - Del.icio.us, Flickr
 - Self centered content annotation
- Shift the admin responsibility to users
 - Users annotate the resources with attributes they care about
 - Users may share their annotations

Proposed Approach

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Peer-to-Peer Resource Annotation

- Scalability
- Increased Utilization
- Increased User Utility

Benefits

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Challenges

- **Scale:** potentially large number of resources to annotate
- **Dynamic attributes:** annotation may expire due to the short life time of some attributes
- **Incentive structure:** users ultimately compete for resources, so what about wrong annotations to divert other users?

Discussion

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Implementation

- OurGrid [CBAC+07] + GridUnit [DCBM06]
 - <http://www.ourgrid.org>
 - <http://sourceforge.net/projects/gridunit>

Discussion

- A more sophisticated information service
 - Multiple clients
 - Stronger consistency requirements

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Automatic Annotation

- GridUnit
- Extension to the JUnit framework
- Resource is annotated based on the output of test cases

Discussion

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Summary & Future Work

- Keep up to date resource information in P2P grids is challenging
- Collaborative resource annotation
 - Inspired on collaborative tagging systems
 - Shift of responsibilities (admins → users)
- Implementation, deployment and experimentation are on the way
- Collaborative annotation in distributed storage systems [**SAAG+08**]

Conclusions

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Questions?

<http://www.ece.ubc.ca/~elizeus/>

<http://www.ourgrid.org>

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References

- **[DCBM06]** Duarte et al. “*GridUnit: Software Testing on the Grid*”. In 28th ACM/IEEE ICSE, 2006.
- **[CBAC+07]** Cirne et al. “Labs of the World Unite!!!”. *Journal of Grid Computing*. Vol 4(3).
- **[SAAG+08]** Santos-Neto et al. “*Enabling Cross-Layer Optimizations in Storage Systems with Custom Metadata*”. HPDC’08.
- <http://www.flickr.com>
- <http://del.icio.us>

Context

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