



Incentives for Resource Provision in Scientific Grids



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Summary



- **Case study: scientific grids, p2p approach**
- **Free-riding is a rational strategy unless incentives are provided**
- **Two main approaches: market models, rules matching consumption with contribution (e.g., bartering)**
- **The focus is on infrastructure investments rather than service provision**
- **In this case the suitability of fixed contribution rules is explored**
- **The basic assumption of this work is that Grid resources form a public good and resources are non-rivalrous in time (no contention)**
 - **The more is total capacity build the less will be the average delay for everyone**
- **This is classic problem in economics, the “private provision of a public good”**
- **Research shows that a fixed contribution scheme is asymptotically optimal in this context**
 - **The model shows that such an optimal threshold can be calculated using a simple optimization problem if the correct parameters are given**
- **The question is to what extent this simple model could form the basis for designing incentives for resource provision in scientific grids**



Comments (1)

- **In real cases some assumptions may not hold (resources may not be dedicated to the grid, some applications may be time critical)**
- **When QoS issues are important, orthogonal research must be pursued (accounting, reputation, etc.)**
- **A problem with accounting is that reporting sites do not have an incentive to be truthful.**
- **Contribution may be difficult to measure, benchmarks can be used.**
- **A similar problem appeared in the US about 30 years when power companies were obliged to buy power back from small producers; correspondences with this research should be sought.**
- **Other factors that should be taken into account include manpower, the cost of data storage and the fact that data is permanent. Storage, does not fit this model because it is consumed and bartering may be more appropriate.**
- **Also look at HP's Tycoon work.**
- **Human behaviour is hard to incorporate in such models; this model assumes that there is no correlation in demand between users.**



Comments (2)

- **Legislation etc. should be taken into account.**
- **In real Grids, like EGEE, utilisation is not 100%, and an important factor is that not all applications may run on all sites as well as that individual organisations may choose the sites where their applications will run (according to QoS).**
- **The difficulty of creating a large numbers of small VOs may be limiting the analysis (the Grid environment is dynamic).**
- **People contribute to Grids for reasons other than simply to get a public good (reputation, politics, synchronous collaboration, etc.).**