1. Problem
• In large scale distributed environments:
  • Applications need access to resources.
  • Systems (Hosts) provide resources.
• Both applications and hosts are autonomous and have their own requirements/constraints:
  • Negotiation enables parties to express these requirements and establish agreements.

2. Negotiation Architecture

3. Negotiation model
• In our model: Domain Coordinators (DCs) mediate between applications and a virtual domain of hosts.
• Applications negotiate time-constrained contracts for resource access (Leases) with Domain Coordinators using pre-defined interfaces.
• DCs interact with Host Managers (HMs) to define one or more appropriate offers based on local usage/access policies.
• Negotiation language and protocol based on WS-Agreement specification.

4. Negotiation Language

5. Two-tiered Negotiation Protocol

6. AgentScape implementation
• This architecture and negotiation protocol have been implemented in AgentScape - a framework for open, large scale, distributed, mobile agent systems.
• Agents negotiate for resource access with multiple domains before migrating, selecting the domain with the best offer.

7. In Conclusion
This negotiation model:
• Based on leases.
• Makes it possible for applications to negotiate with multiple domain coordinators in advance, selecting the domain with the best offer.
• Respects autonomy of applications and resource providers.
• Supports domain-wide resource management: local information is aggregated on demand at domain level.