**VGrADS**

Virtual Grid Application Software Development Project

- An NSF-sponsored ITR Project to simplify programming on the Computational Grid by
  - Providing *Virtual Grid (VG)* abstraction
  - Building *Tools and Techniques* on the VG
  - Testing on *Scientific Applications*

**Virtual Grid (VG)**

- Provides application-level resource abstraction
  - Based on studies of real application needs
- VG Description Language (vgDL) lets application specify
  - Aggregations: ClusterOf, TightBagOf, LooseBagOf
  - Couplers: Close, Far, HighBW, LowBW
  - Constraints: provided by grid information service
- VG Execution System (vgES) implements VGs
  - Find and Bind resources for VG
  - Monitor VG
  - Manage VG dynamically (future work)

```
EMAN = LooseBagOf<Node4>[1:4] {
  Node4 = ClusterOf<Node5>[1:64] {
    Node5 = [CPU=Opteron OR CPU=Itanium2]
  }
}
```

**Scientific Applications**

- Inspire ideas for VG abstraction and tools
  - And provide real-world validation
- EMAN - Electron Micrograph Analysis
  - Workflow scheduling, performance prediction
- GridSolve - Linear Algebra Portal
  - Fault tolerance, resource management
- LEAD - Atmospheric Science
  - Dynamic scheduling, streaming data, fault tolerance, ...

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