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Current Approaches To Resource Representation

The Elusive RSpec

- ... not really elusive any more
- Control Frameworks are each taking their own approaches
- These approaches are quite different

Approach I: Ontology

- System of understanding resources and the relationships between them
- Encourages “minimum” requirement specifications ...
 - 100 nodes on three continents with 1Gbps links
 - 5 nodes within 100m radius and single channel
- ... while allowing detailed ones
 - Port1@Node04 connected_to Port12@Switch32
- Starting points:
 - Network Description Language (NDL)
 - Semantic Web tools (e.g. reasoners)
- Taken by ORBIT and ORCA CFs

Approach II: Extensible Data Structure

- RSpec is a simple data structure
 - Defined by an XML Schema
- Describe the world at its most basic level
 - Tell you what you get, not what you can build on it
- Some information is understood out-of-band
 - Eg. semantics of PCs, Ethernet, 802.11, etc.
- Much of the interesting work done in extensions to base RSPEC
- Taken by ProtoGENI CF

Approach III: To Each His Own

- No such thing as “one size fits all” RSpec
- You only need to understand an RSpec if you understand the substrate it’s describing
- Let each major substrate define its own
 - Existing examples: PlanetLab and OpenFlow
- XML-Based
- Approach taken by PlanetLab CF

Questions

- How compatible are these approaches?
- How hard would it be to converge on a common framework?
 - Should we?
- How do these descriptions fit into a larger resource discovery story?