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IT IS DEAD... LONG LIVE IT!

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3C²: The world of computing has changed

- Consumer Computing
 - Proliferation of personal devices
 - Ubiquitous connectivity
 - Augmented reality
 - Amplified diversified interests: "...There is an app for that..."
 - Community Computing
 - Social networking
 - Crowd sourcing
 - Recommendation systems
 - Cloud Computing
 - Extreme computing power
 - Low barrier of entrance
- 



The Business has changed

Computing is changing from a productivity-driven business to a service-driven business.

- Fast content creation
 - Extreme personalization
 - Advertising-driven revenue
 - ...
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IT (as we know it) is dead


A New Paradigm is emerging

- Mobile clients + mega data centers
- IT companies are operation companies
- The ones with best resource efficiency win
- New IT industry: “separation of concerns”

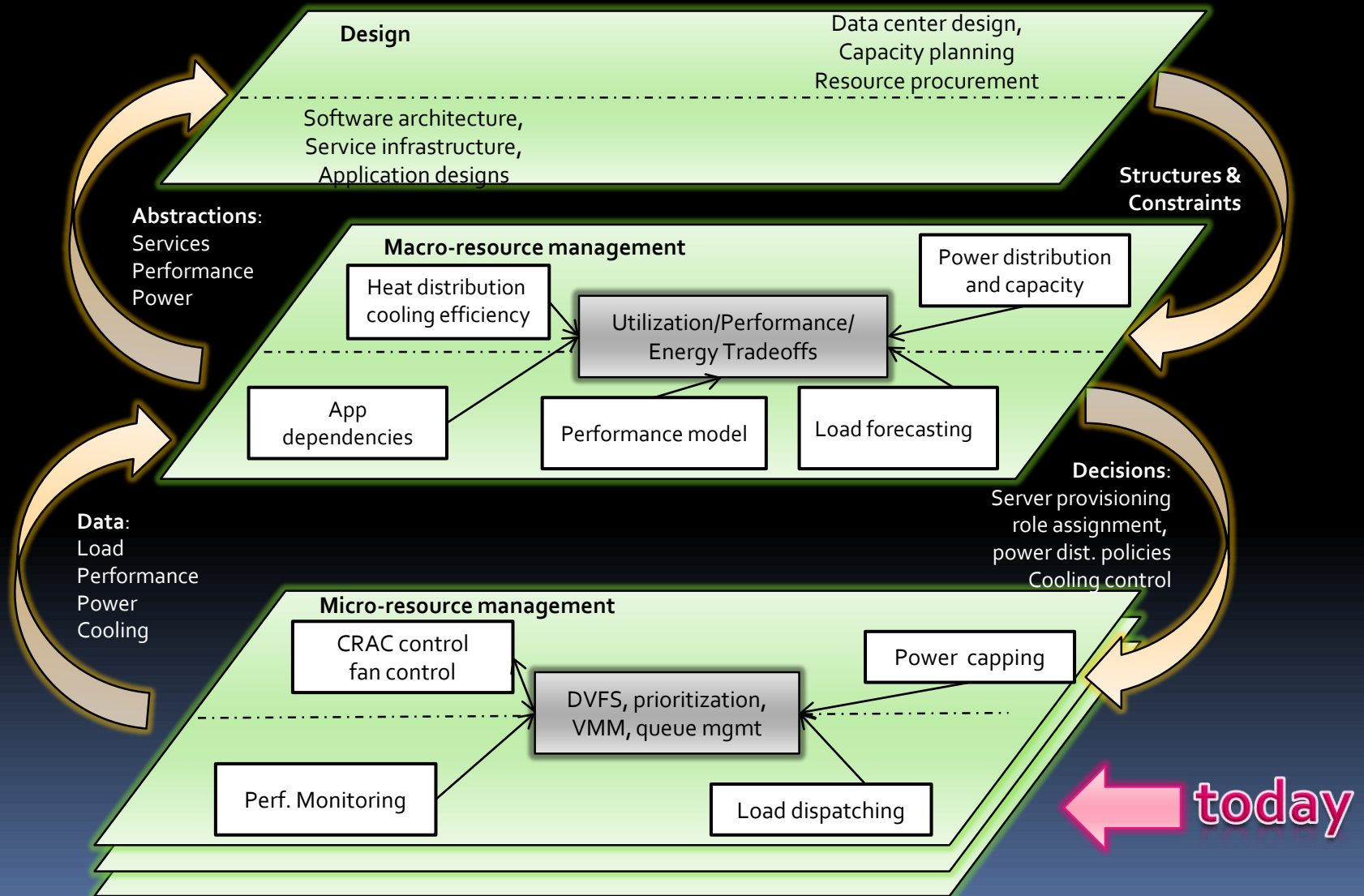
“The world needs about five computers...”



IT Operations Today

- Conservative provisioning
 - Static resource allocation
 - Load balancing
 - Multi-layer redundancy
 - Micro-resource management
 - Rigid boundaries
 - Tightly coupled concerns
 - Labor intensive
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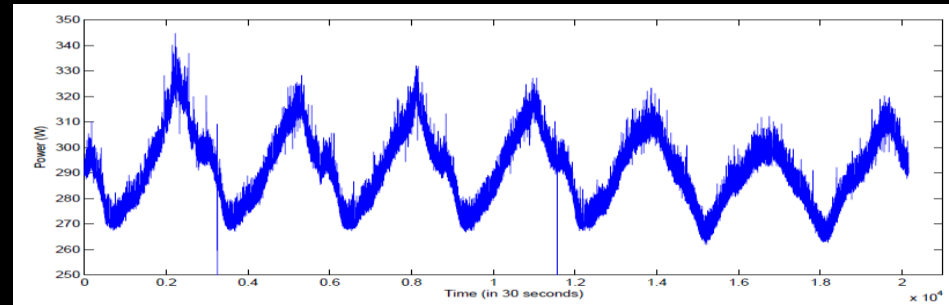
Make IT Sustainable



Feedback Control Challenges

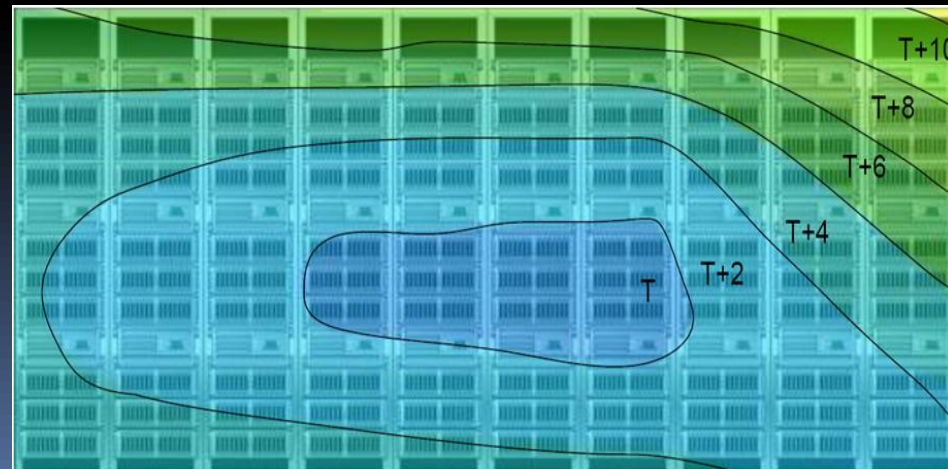
■ Physical and computing dynamics

- Time and space scale
- Number of variables
- Sensors and observability
- Actuators and controllability



■ Run time learning and adaptation

■ Design methodology and tools





Can We Succeed?

- Will IT industry be more efficient?
 - Yes
 - Will IT industry consume less?
 - No
 - Do we have the right tools?
 - Not yet...
 - Do we have the right people?
 - Yes, but not enough...
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