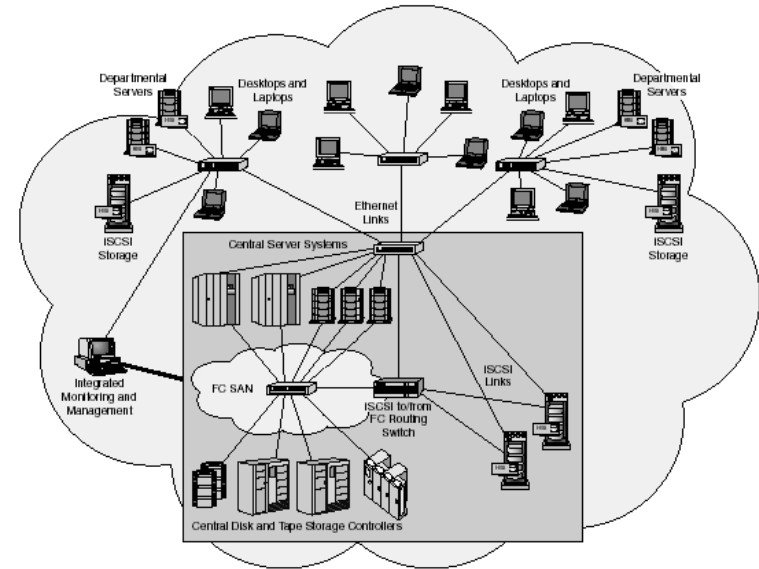
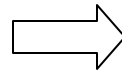
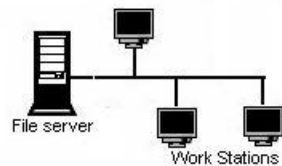


Computing System Management Challenges



- Increased human dependence on software
- Increased software complexity
- Increased management cost, IT spending
 - 15 years ago: 75% of on new hardware and software 25% on fixing
 - now: **70-80%** on fixing and maintaining existing systems
 - **\$750 billion** per year worldwide to deal with complexity

Four Aspects of Self-Management

Self-configuring

Automated configuration
of components and systems

Self-healing

Discover, diagnose, and
repair problems

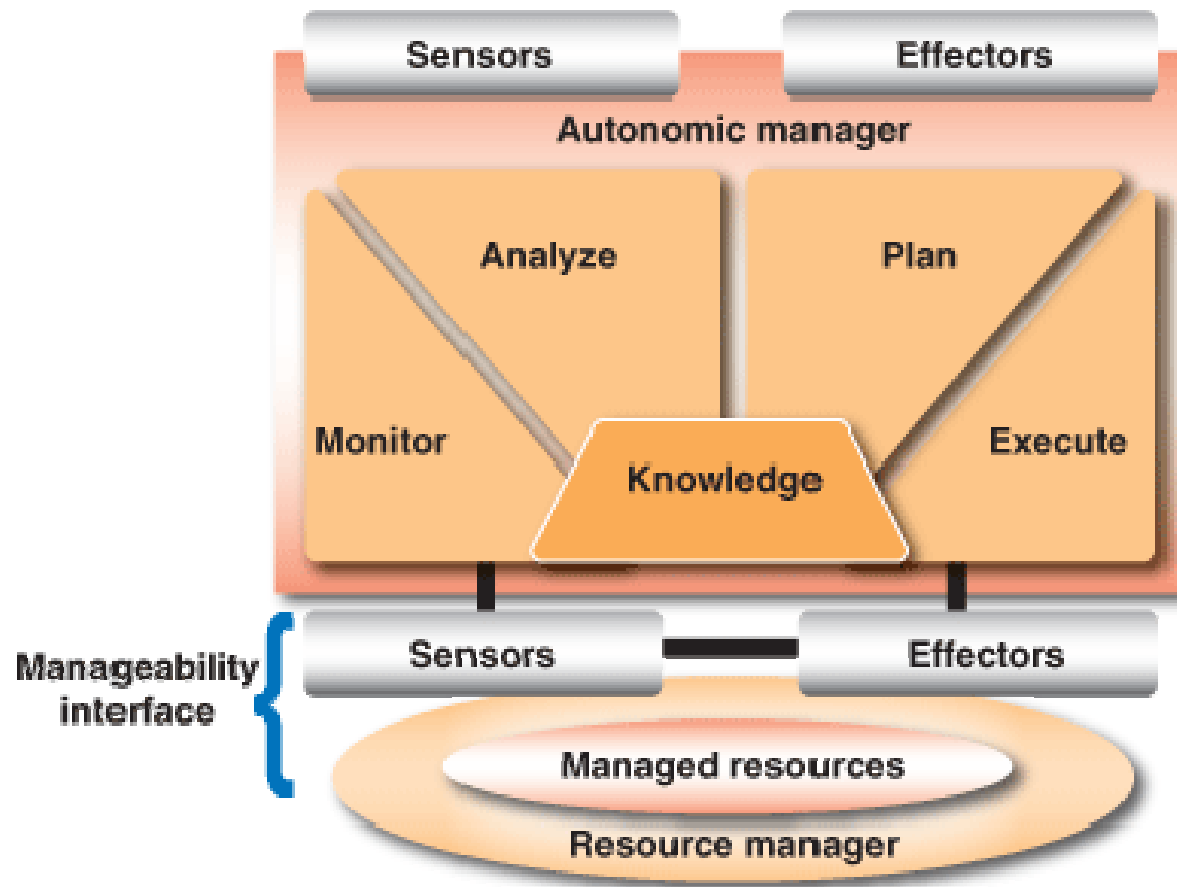
Self-optimizing

Govern performance and
efficiency continually

Self-protecting

Anticipate, detect, and
defend against attacks or
cascading failures

An Autonomic Control Loop*



* Autonomic Computing, Richard Murch 2004