Operating Systems

- **Category I: Uniquely Exascale**
  - Define the base OS (Standard API)
    - Need is urgent: community needs to know what APIs everyone can count on for runtime and libraries
  - APIs for resilience (access to RAS, etc)
    - Needed to enable higher level resilience (in runtime or libraries)
  - System wide power management
    - i.e., power aware job scheduling
  - Collective OS operations
    - We can probably live with what we have now

- **Category II: Exascale plus trickle down**
  - Scalable system simulation environment
    - Needed for off-line studies – not limited to OS, could be used for development, debugging, etc.
  - Improved APIs for scalable performance monitoring and debugging
    - Scalability needs are unique to Exascale, other aspects can be imported or exported to commodity
  - New APIs for energy management
    - Needed in embedded systems, their APIs should be relatively easy to tweak for Exascale

- **Category III: Primarily Sub-exascale**
  - Improved APIs for explicit memory management
    - Includes APIs for on- and off-node interconnects
    - We can probably live with current APIs for interconnects
  - Improved APIs for threading
    - Many core system imply that commodity will need to address this

How well will unique aspects of Exascale runtime systems will map to the commodity APIs?