

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?