

# High Application Availability

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- ❑ **Percentage of time primary application is available**

$$\frac{\text{MTBF}}{\text{MTBF} + \text{MTTR}}$$

- ❑ **Common requirement is “5-9’s” - 99.999%**
  - About 5 minutes down time per year
- ❑ **Failures caused by hardware, software or user**
- ❑ **Large HPEC system may have an MTBF of a few weeks**

# ***Fault Management***

- Detection - determine that fault exists**
- Diagnosis - identify failing component**
- Isolation - protect rest of system from failures**
- Recovery - get application running again**
- Repair - replace or restart failing component**

## ***Conclusion***

- ❑ **HAA requires careful SYSTEM level analysis/design - hardware, system software and application must ALL cooperate**
- ❑ **Emerging fabrics like InfiniBand enable HAA capabilities not available previously for HPEC applications**
- ❑ **5 step fault management process useful for design of HAA applications**