Internet based vehicle simulation technologies

Dr. Roger L. McCarthy, P.E.
Chairman
Exponent Failure Analysis Associates, Inc.
sfrlm@exponent.com
The Internet role in simulation technology is application determined

• Discussion of this role requires agreement on the goals and characteristics of simulation

• Sophisticated simulation offers significant assistance in design

• Are user/consumers of simulation output highly centralized or highly distributed?
Sophisticated simulation utility is HIGHLY computation dependant

- Lower order models that compute rapidly are of marginal utility
  - Completely useless for limit behavior.
  - Capable of reliably predicting performance changes only for gross design differences.

- Computational requirements of a higher order model scale as a power of the power.

- Any good tire model alone will bring a PC to its knees
More general characteristics of sophisticated vehicle simulation

- **Input parameters are staggering**
  - Beyond the capability of most users to measure.
  - Utility will be decimated if they have to be independently “entered” by each user.
  - Lumped input parameters produce lumpy results

- **Desired output parameters are typically much leaner than the input**
Distributed simulation today: echo of distributed computing.. pre Java and pre DSL, Cable, etc.

- Mainframe centralized software versus numerous pc versions
- GUI bandwidth versus computing speed
- Common identical databases versus numerous distributed data repositories
The internet offers the best of both distributed and centralized computing

- High bandwidth combined with Java delivers distributed GUI
- Code and data repositories can be centralized for huge user groups.
- Problem solving teams can be vastly larger, and NOT co-located
- Computing power is not PC limited