**Advanced Real Time Simulation System**

**Real Time Simulation:** Executing a computer model of a physical system at the same rate as actual "wall clock" time. For example, if a process takes 10 minutes to finish in the real-world, the simulation would take 10 minutes as well.

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**Why Real Time Simulation**

1- **Gaining Time**
   - Find problems at an earlier stage in the design process;
   - Proceeding to a device design while the actual system is not physically available.

2- **Lowering Cost**
   - Reduces enormous cost on testing a new device under real conditions;
   - The real-time system could test many possible configurations without physical modification.

3- **Increasing Test Functionalities**
   - High flexibility by being able to modify all parameters and signals of the test system at a glance.
   - Automatic test script to run tests 24 hours a day, 7 days a week.

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**System Introduction**

- 4 Real Time Target Machines;
- 8 CPUs with Totally 48 Cores: Intel Xeon Six-Core, 3.33 GHz;
- 4 User Programmable FPGAs : Xilinx Spartan-3 FPGAs;
- 512 Digital IO and 256 Analog IO;
- Dolphin Real Time Communication Link: Latency as low as 0.2 us.

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**Application Example in Smart Grid Design**

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