Charm++: What Have We Learned

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Genesis/History

- **1983-1986**: Parallel Prolog, the Reduce-Or process model. First prolog system
  - Recognition that many higher level systems such as Prolog need
    - a common base of support,
    - portability across parallel machines
- **1991 - Present**: Refinements, libraries, tools, applications
Summary of Developments

- **Tools:**
  - Visual Programming,
  - Performance Feedback,
  - Expert Performance Analysis,
  - Automatic Runtime Optimizations

- **Language Extensions:**
  - Charm++: (1993): C++ based version
  - Dagger,
  - Structured Dagger,
  - Chare-Arrays.
  - DP-lib (DP-Charm)
Lessons

- Parsing/translation: major effort wasted
- Syntactic extensions: rethink
- Interoperability is essential: led to Converse
- C++ versus C
- Portability: recognized widely by now as useful.
- Message Driven Execution: the modularity/efficiency advantage
- Prioritization,
- Automatic dynamic load balancing: proved useful.