MRNet: Multicast/Reduction Network
Scalable Communication for Extreme Scale Systems

**MRNet Overview**
- Tree-Based Overlay Network for scalable tools and applications.
- Process hierarchy for efficient group communication.
- In-network aggregation for efficient data analysis.

**MRNet Improves Tool Performance by Distributing Data Processing**

**Un-enhanced Distributed Tool**

**MRNet-enabled Distributed Tool**

**MRNet Interface**
- C++ API
- Customized network topology.
- Communicators group endpoints.
- Streams bind communicator groups and filters that aggregate the dataflow.
- Tool-specific filters can be loaded into MRNet.

**MRNet Features**
- High-throughput data transfers.
- Fully customizable topologies.
- Simple filters built-in.
- Dynamic loading of user-defined filters for custom aggregation.
- Concurrent data flows with different aggregation schemes.
- Fault-tolerant to process, node and network failures.
- Liberal, open-source licensing.

**MRNet Projects**
- **STAT:** Efficient Stack Trace Analysis using MRNet
  - STAT recently demonstrated at 1 million processes

http://www.paradyn.org/mrnet
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