

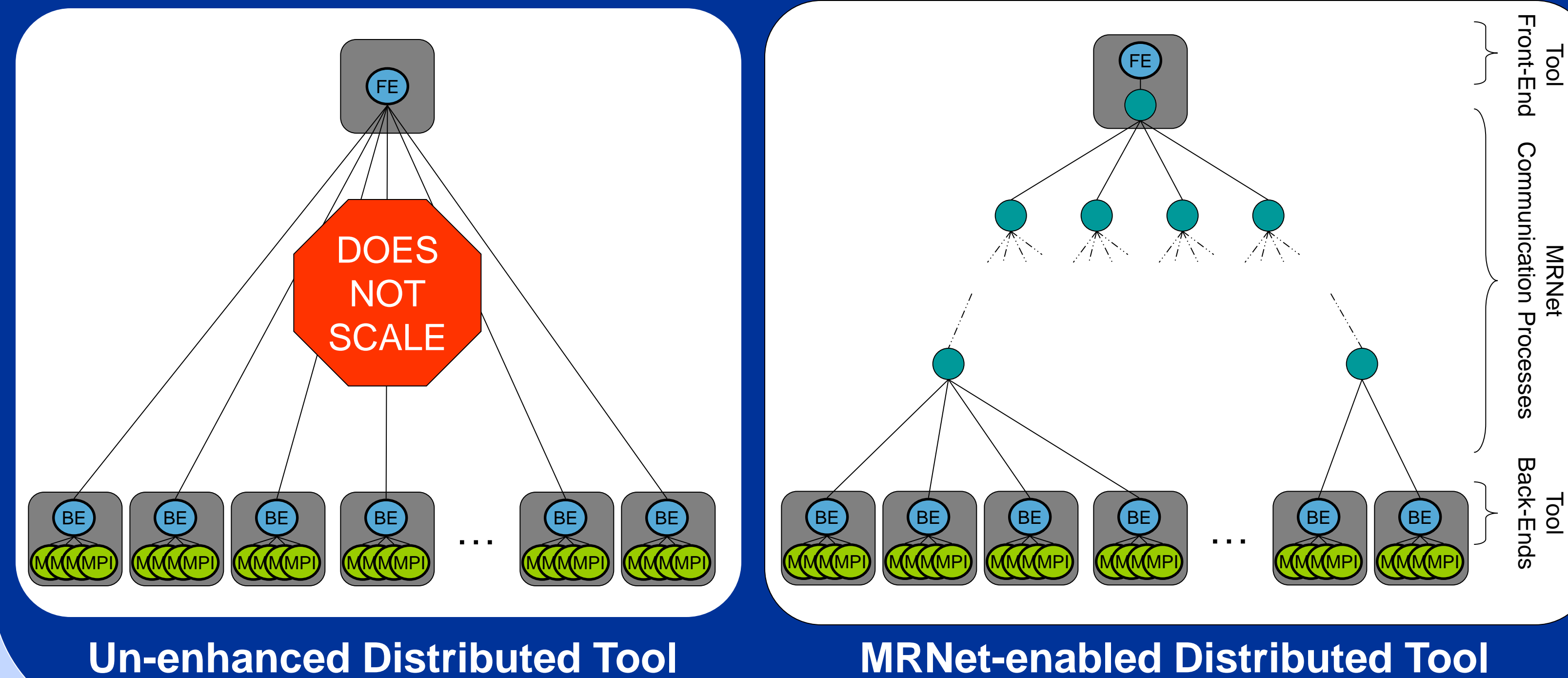
### MRNet Overview

- **T**ree-**B**ased **O**verlay **N**etwork for scalable tools and applications.
- Process hierarchy for efficient group communication.
- In-network aggregation for efficient data analysis.

### 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.

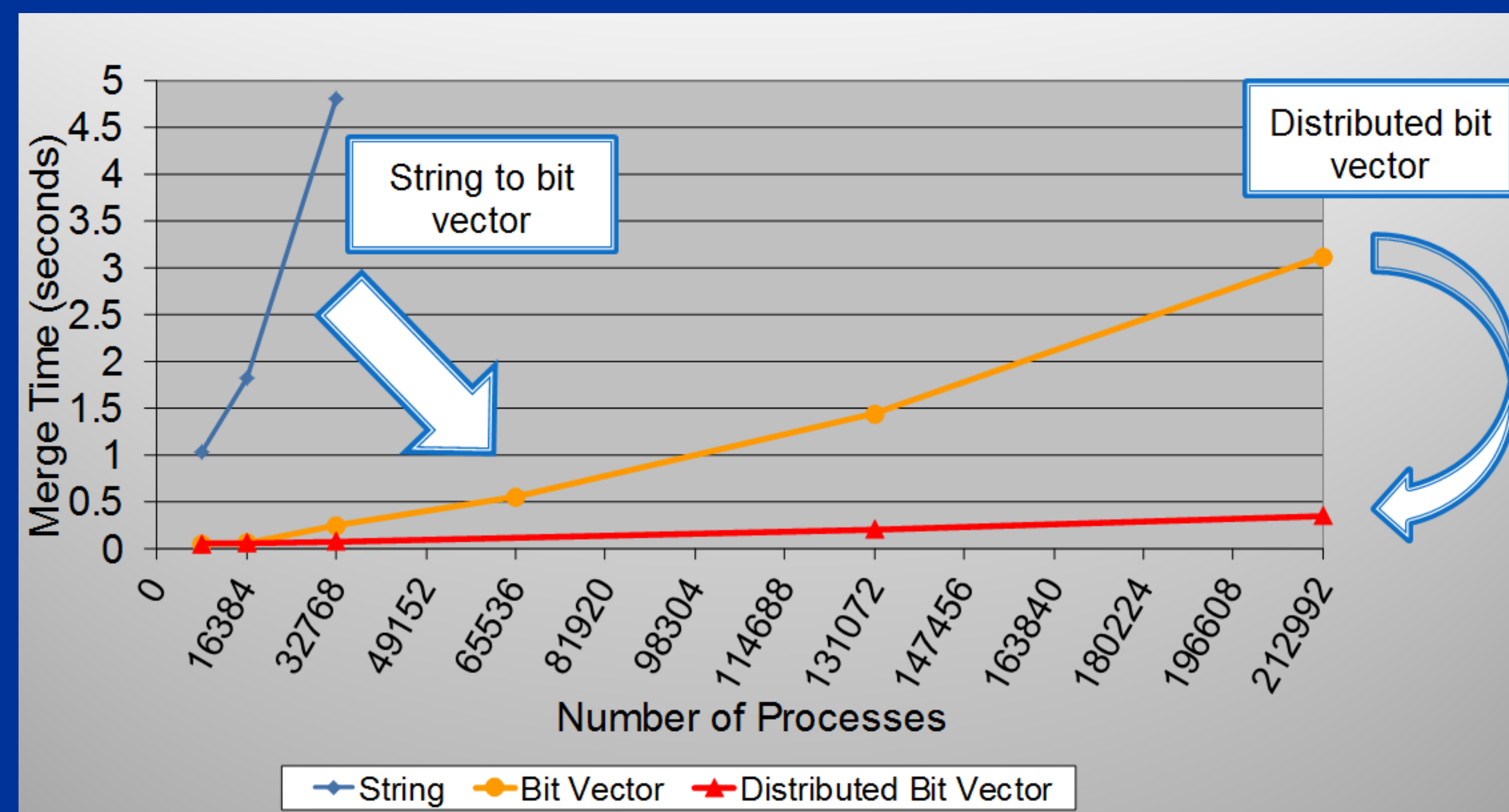
### MRNet Improves Tool Performance by Distributing Data Processing



### 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.

### STAT: Efficient Stack Trace Analysis using MRNet



**STAT recently demonstrated at 1 million processes**

### MRNet Projects

- **S**tack **T**race **A**nalysis **T**ool (LLNL)
  - Spatial/temporal trace sampling and analysis
- **T**au**O**ver**M**RNet (University of Oregon)
  - Scalable trace data collection and analysis
- **T**BON-**F**S (University of Wisconsin)
  - Scalable group process control & inspection
- **M**r. **S**can (University of Wisconsin)
  - DBSCAN clustering on extremely large datasets
- **C**EPBA-**T**ools (Universitat Politècnica de Catalunya)
  - Scalable control of trace collection
- **O**pen|**S**peed**S**hop (Krell Institute)
  - Scalable performance data collection/analysis
- **P**aradyn (University of Wisconsin)
  - Efficient startup, performance data collection/analysis