PP

MR

MC

MP2P

MS

SM

SPMD

BSP

Fusion

Dataflow

Agents

WF

GIS

HPC Simulations

IoT

Metadata/Provenance

Shared / Dedicated / Transient / Permanent

Archived/Batched/Streaming

HDFS/Lustre/GPFS

Files/Objects

EDM

SQL/NoSQL/NewSQL

Ogre Views and Facets

PM

Flops/Byte

Flops/Byte; Memory I/O

Execution Environment; Core Libraries

Volume

Velocity

Variety

Veracity

Communication Structure

Iterative / Simple

Metric = M / Non-Metric = N

$O\left(N^{2}\right)$ = NN / $O(N)$ = N

Regular = R / Irregular = I

Dynamic = D / Static = S

Linear Algebra Kernels

Graph Algorithms

Deep Learning

Classification

Recommender Engine

Search / Query / Index

Basic Statistics

Optimization Methodology

Global Analytics

Local Analytics

Micro-benchmarks

Visualization

Streaming

**Problem**

**Architecture View**

**Data Source and**

**Style View**

**Execution View**

**Processing View**

Acronyms (in alphabetical order):

 BSP – Bulk Synchronous Parallel

 EDM – Enterprise Data Model

 GA – Global Analytics

 GIS – Geographic Information System

 IoT – Inter of Things

 MC – Map-Collective

 MP2P – Map Point-to-Point

 MR – Classic MapReduce

 MS – Map Streaming

 PM – Performance Metrics

 PP – Pleasingly Parallel

 SM – Shared Memory

 SPMD – Single Program Multiple Data

 WF –Workflow

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Alignment

6

Data Abstraction

12

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| --- | --- | --- | --- | --- |
| **Algorithm** | **Problem Architecture View**  | **Execution View** | **Data Source and Style View** | **Processing View** |
| **HiBench** |
| Sort | 2, 7 | 12=K | 4=HDFS, 5=Batched | 1 |
| WordCount | 2, 7 | 12=K | 4=HDFS, 5=Batched | 8 |
| TeraSort | 2, 7 | 12=K | 4=HDFS, 5=Batched | 8 |
| EnhancedDFSIO |  |  | 4=HDFS | 1 |
| Nutch Indexing | 2, 7 | 9=S, 10=I | 4=HDFS, 5=Batched | 9 |
| Page Rank | 3, 4, 7 | 9=S, 10=I, 11, 12=V | 4=HDFS, 5=Batched | 3, 13, 14 |
| Bayesian |  |  |  |  |
| K-Means | 3, 7, 8 | 9=D, 10=I, 11, 13=M, 14=N | 4=HDFS, 5=Batched | 3, 4=EM |
| Hive Join |  |  |  |  |
| Hive Aggregation |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |