

My Project

Generated by Doxygen 1.8.17

1 Conducting Unit Tests for Compound Config.	1
2 Hierarchical Index	3
2.1 Class Hierarchy	3
3 Class Index	7
3.1 Class List	7
4 Class Documentation	11
4.1 AccessStatMatrix Struct Reference	11
4.1.1 Detailed Description	12
4.2 AccessStats Struct Reference	12
4.2.1 Detailed Description	12
4.3 sparse::ActionOptimization Struct Reference	13
4.4 Application Class Reference	13
4.5 ArchProperties Class Reference	13
4.6 ArchSpace Class Reference	14
4.7 ArchSpaceNode Class Reference	14
4.8 ArchSweepNode Class Reference	14
4.9 model::ArithmeticUnits Class Reference	15
4.10 model::Attribute< T > Class Template Reference	16
4.11 AxisAlignedHyperRectangle Class Reference	16
4.12 problem::BandedDistribution Class Reference	17
4.13 problem::Bitmask Class Reference	18
4.14 model::BufferLevel Class Reference	19
4.15 CartesianCounter< order > Class Template Reference	21
4.16 CartesianCounterDynamic Class Reference	21
4.17 CartesianCounterGeneric< T > Class Template Reference	22
4.18 config::CompoundConfig Class Reference	22
4.19 config::CompoundConfigNode Class Reference	23
4.19.1 Member Function Documentation	24
4.19.1.1 instantiateKey()	24
4.19.1.2 push_back()	24
4.19.1.3 resolve()	25
4.19.1.4 setScalar()	25
4.20 tiling::CompoundTile Struct Reference	26
4.21 tiling::CompoundTileNest Struct Reference	26
4.22 analysis::CompoundTileNest Struct Reference	26
4.23 sparse::CompressionInfo Struct Reference	27
4.24 tiling::ComputeInfo Struct Reference	27
4.25 analysis::ComputeInfo Struct Reference	28
4.26 sparse::ConditionedOnOptimization Struct Reference	28
4.27 mapping::Constraints Class Reference	28

4.28 problem::CoordinatePayload Class Reference	30
4.29 tiling::CoordinateSpaceTileInfo Struct Reference	30
4.30 tiling::DataMovementInfo Struct Reference	31
4.31 analysis::DataMovementInfo Struct Reference	33
4.32 problem::DensityDistribution Class Reference	33
4.33 problem::DensityDistributionFactory Class Reference	34
4.34 problem::DensityDistributionSpecs Struct Reference	34
4.35 problem::DensityModelIncapability Class Reference	35
4.36 loop::Descriptor Class Reference	35
4.37 DesignSpaceExplorer Class Reference	36
4.38 loop::Nest::SkewDescriptor::Term::DimSpec Struct Reference	36
4.39 DynamicArray< T > Class Template Reference	37
4.40 analysis::ElementState Struct Reference	37
4.41 model::Engine Class Reference	38
4.42 model::EvalStatus Struct Reference	39
4.43 EvaluationResult Struct Reference	39
4.44 search::ExhaustiveSearch Class Reference	40
4.45 sparse::ExplicitReadOptimizationImpact Struct Reference	40
4.46 tiling::ExtraTileConstraintInfo Struct Reference	40
4.47 Factoradic< T > Class Template Reference	41
4.48 Factors Class Reference	41
4.49 FailInfo Struct Reference	42
4.50 problem::FixedStructuredDistribution Class Reference	42
4.51 Gradient Struct Reference	43
4.52 search::HybridSearch Class Reference	43
4.53 problem::HypergeometricDistribution Class Reference	44
4.54 mapspace::IndexFactorizationSpace Class Reference	45
4.55 ISLPointSet Class Reference	45
4.56 model::LegacyNetwork Class Reference	46
4.57 model::Level Class Reference	47
4.58 model::LevelSpecs Struct Reference	48
4.59 search::LinearPrunedSearch Class Reference	48
4.60 analysis::LoopState Class Reference	49
4.61 MapperThread Class Reference	49
4.62 Mapping Struct Reference	50
4.63 mapspace::MapSpace Class Reference	51
4.64 problem::MetaDataFormat Class Reference	51
4.65 problem::MetaDataFormatFactory Class Reference	52
4.66 problem::MetaDataFormatSpecs Struct Reference	52
4.67 problem::MetaDataOccupancyQuery Struct Reference	53
4.68 model::Module Class Reference	54
4.69 MultiAAHR Class Reference	54

4.70 loop::Nest Class Reference	55
4.70.1 Detailed Description	56
4.71 analysis::NestAnalysis Class Reference	56
4.72 model::Network Class Reference	56
4.73 model::NetworkFactory Class Reference	57
4.74 model::NetworkSpecs Struct Reference	58
4.75 problem::OperationPoint Class Reference	58
4.76 problem::OperationSpace Class Reference	59
4.77 PatternGenerator128 Class Reference	59
4.78 problem::PerDataSpace< T > Class Template Reference	60
4.79 sparse::PerDataSpaceCompressionInfo Struct Reference	60
4.80 problem::PerFlattenedDimension< T > Class Template Reference	61
4.81 mapspace::PermutationSpace Class Reference	61
4.82 problem::PerRankMetaDataTileOccupancy Struct Reference	62
4.83 Point Class Reference	62
4.84 PointResult Struct Reference	63
4.85 ProblemSpace Class Reference	63
4.86 ProblemSpaceNode Class Reference	64
4.87 RandomGenerator128 Class Reference	64
4.88 search::RandomPrunedSearch Class Reference	65
4.89 search::RandomSearch Class Reference	65
4.90 model::ReductionTreeNetwork Class Reference	65
4.91 ResidualFactors Class Reference	67
4.92 mapspace::ResidualIndexFactorizationSpace Class Reference	67
4.93 mapspace::Ruby Class Reference	67
4.94 mapspace::RubyPermutationSpace Class Reference	68
4.95 problem::RunLengthEncoding Class Reference	69
4.96 search::SearchAlgorithm Class Reference	70
4.97 SequenceGenerator128 Class Reference	70
4.98 sparse::SetOfOperationSpaces Struct Reference	70
4.99 problem::Shape Class Reference	71
4.100 model::SimpleMulticastNetwork Class Reference	72
4.101 loop::Nest::SkewDescriptor Struct Reference	73
4.102 sparse::SparseAnalysisState Struct Reference	73
4.103 sparse::SparseOptimizationInfo Struct Reference	74
4.104 sparse::SpatialExpansion Struct Reference	74
4.105 mapspace::SpatialSplitSpace Class Reference	75
4.106 model::Topology::Specs Class Reference	75
4.107 problem::CoordinatePayload::Specs Struct Reference	76
4.108 problem::UncompressedBitmask::Specs Struct Reference	76
4.109 model::SimpleMulticastNetwork::Specs Struct Reference	77
4.110 model::ReductionTreeNetwork::Specs Struct Reference	78

4.111 model::Engine::Specs Struct Reference	79
4.112 problem::FixedStructuredDistribution::Specs Struct Reference	79
4.113 problem::UncompressedOffsetPair::Specs Struct Reference	80
4.114 problem::RunLengthEncoding::Specs Struct Reference	81
4.115 model::LegacyNetwork::Specs Struct Reference	81
4.116 model::BufferLevel::Specs Struct Reference	82
4.117 problem::Bitmask::Specs Struct Reference	84
4.118 problem::BandedDistribution::Specs Struct Reference	85
4.119 problem::HypergeometricDistribution::Specs Struct Reference	85
4.120 model::ArithmeticUnits::Specs Struct Reference	86
4.121 MapperThread::Stats Struct Reference	87
4.122 model::BufferLevel::Stats Struct Reference	87
4.123 model::Topology::Stats Struct Reference	89
4.124 model::SimpleMulticastNetwork::Stats Struct Reference	89
4.125 model::LegacyNetwork::Stats Struct Reference	90
4.126 Application::Stats Struct Reference	91
4.127 model::ReductionTreeNetwork::Stats Struct Reference	91
4.128 mapspace::Status Struct Reference	92
4.129 TaggedBound< K > Struct Template Reference	92
4.130 loop::Nest::SkewDescriptor::Term Struct Reference	92
4.131 model::Topology Class Reference	93
4.132 mapspace::Uber Class Reference	94
4.133 problem::UncompressedBitmask Class Reference	95
4.134 problem::UncompressedOffsetPair Class Reference	95
4.135 problem::Workload Class Reference	96
Index	99

Chapter 1

Conducting Unit Tests for Compound Config.

1. First, copy the files from the directories beginning with 00, 01, and 02 in the following linked [repo](#).
2. Then, move every YAML file one folder up, in accordance to how their paths are structured in the FILES variable in test-compound-config.cpp.
3. In order to use the unit tests library, please compile Timeloop as normal.
4. Then, run `$./bin/timeloop-unit-tests` from the repo root.
5. Given you have set up the YAML files correctly, you have just run a unit-test for compound-config.cpp.

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

AccessStatMatrix	11
AccessStats	12
sparse::ActionOptimization	13
Application	13
ArchProperties	13
ArchSpace	14
ArchSpaceNode	14
ArchSweepNode	14
model::Attribute< T >	16
model::Attribute< bool >	16
model::Attribute< double >	16
model::Attribute< std::string >	16
model::Attribute< std::uint64_t >	16
model::Attribute< Technology >	16
AxisAlignedHyperRectangle	16
CartesianCounter< order >	21
CartesianCounter< int(Dimension::Num)>	21
CartesianCounterDynamic	21
CartesianCounterGeneric< T >	22
config::CompoundConfig	22
config::CompoundConfigNode	23
tiling::CompoundTile	26
tiling::CompoundTileNest	26
analysis::CompoundTileNest	26
sparse::CompressionInfo	27
tiling::ComputeInfo	27
analysis::ComputeInfo	28
sparse::ConditionedOnOptimization	28
mapping::Constraints	28
tiling::CoordinateSpaceTileInfo	30
tiling::DataMovementInfo	31
analysis::DataMovementInfo	33
problem::DensityDistribution	33
problem::BandedDistribution	17
problem::FixedStructuredDistribution	42

problem::HypergeometricDistribution	44
problem::DensityDistributionFactory	34
problem::DensityDistributionSpecs	34
problem::BandedDistribution::Specs	85
problem::FixedStructuredDistribution::Specs	79
problem::HypergeometricDistribution::Specs	85
loop::Descriptor	35
DesignSpaceExplorer	36
loop::Nest::SkewDescriptor::Term::DimSpec	36
DynamicArray< T >	37
problem::PerDataSpace< T >	60
problem::PerFlattenedDimension< T >	61
DynamicArray< AccessStatMatrix >	37
problem::PerDataSpace< AccessStatMatrix >	60
DynamicArray< bool >	37
problem::PerDataSpace< bool >	60
DynamicArray< DataMovementInfo >	37
problem::PerDataSpace< DataMovementInfo >	60
DynamicArray< double >	37
problem::PerDataSpace< double >	60
DynamicArray< Factors >	37
problem::PerFlattenedDimension< Factors >	61
DynamicArray< Point >	37
problem::PerDataSpace< Point >	60
DynamicArray< ResidualFactors >	37
problem::PerFlattenedDimension< ResidualFactors >	61
DynamicArray< std::bitset< MaxTilingLevels > >	37
problem::PerDataSpace< std::bitset< MaxTilingLevels > >	60
DynamicArray< std::map< std::string, double > >	37
problem::PerDataSpace< std::map< std::string, double > >	60
DynamicArray< std::map< std::string, std::uint64_t > >	37
problem::PerDataSpace< std::map< std::string, std::uint64_t > >	60
DynamicArray< std::map< std::string, tiling::PerTileFormatAccesses > >	37
problem::PerDataSpace< std::map< std::string, tiling::PerTileFormatAccesses > >	60
DynamicArray< std::map< unsigned long, unsigned long > >	37
problem::PerDataSpace< std::map< unsigned long, unsigned long > >	60
DynamicArray< std::size_t >	37
problem::PerDataSpace< std::size_t >	60
DynamicArray< std::string >	37
problem::PerDataSpace< std::string >	60
DynamicArray< std::uint64_t >	37
problem::PerDataSpace< std::uint64_t >	60
DynamicArray< std::vector< DataMovementInfo > >	37
problem::PerDataSpace< std::vector< DataMovementInfo > >	60
DynamicArray< std::vector< double > >	37
problem::PerDataSpace< std::vector< double > >	60
DynamicArray< std::vector< sparse::SpatialExpansion > >	37
problem::PerDataSpace< std::vector< sparse::SpatialExpansion > >	60
DynamicArray< std::vector< std::vector< std::uint64_t > > >	37
problem::PerDataSpace< std::vector< std::vector< std::uint64_t > > >	60
DynamicArray< tiling::PerTileFormatAccesses >	37
problem::PerDataSpace< tiling::PerTileFormatAccesses >	60

DynamicArray< unsigned >	37
problem::PerDataSpace< unsigned >	60
DynamicArray< unsigned long >	37
problem::PerDataSpace< unsigned long >	60
analysis::ElementState	37
model::EvalStatus	39
EvaluationResult	39
exception	
problem::DensityModelIncapability	35
sparse::ExplicitReadOptimizationImpact	40
tiling::ExtraTileConstraintInfo	40
Factoradic< T >	41
Factoradic< problem::Shape::FlattenedDimensionID >	41
Factors	41
FailInfo	42
Gradient	43
mapspace::IndexFactorizationSpace	45
ISLPointSet	45
model::LevelSpecs	48
model::ArithmeticUnits::Specs	86
model::BufferLevel::Specs	82
analysis::LoopState	49
MapperThread	49
Mapping	50
mapspace::MapSpace	51
mapspace::Ruby	67
mapspace::Uber	94
problem::MetaDataFormat	51
problem::Bitmask	18
problem::CoordinatePayload	30
problem::RunLengthEncoding	69
problem::UncompressedBitmask	95
problem::UncompressedOffsetPair	95
problem::MetaDataFormatFactory	52
problem::MetaDataFormatSpecs	52
problem::Bitmask::Specs	84
problem::CoordinatePayload::Specs	76
problem::RunLengthEncoding::Specs	81
problem::UncompressedBitmask::Specs	76
problem::UncompressedOffsetPair::Specs	80
problem::MetaDataOccupancyQuery	53
model::Module	54
model::Engine	38
model::Level	47
model::ArithmeticUnits	15
model::BufferLevel	19
model::Network	56
model::LegacyNetwork	46
model::ReductionTreeNetwork	65
model::SimpleMulticastNetwork	72
model::Topology	93
MultiAAHR	54
loop::Nest	55
analysis::NestAnalysis	56
model::NetworkFactory	57
model::NetworkSpecs	58

model::LegacyNetwork::Specs	81
model::ReductionTreeNetwork::Specs	78
model::SimpleMulticastNetwork::Specs	77
problem::OperationSpace	59
PatternGenerator128	59
RandomGenerator128	64
SequenceGenerator128	70
sparse::PerDataSpaceCompressionInfo	60
mapspace::PermutationSpace	61
mapspace::RubyPermutationSpace	68
problem::PerRankMetaDataTileOccupancy	62
Point	62
problem::OperationPoint	58
PointResult	63
ProblemSpace	63
ProblemSpaceNode	64
ResidualFactors	67
mapspace::ResidualIndexFactorizationSpace	67
search::SearchAlgorithm	70
search::ExhaustiveSearch	40
search::HybridSearch	43
search::LinearPrunedSearch	48
search::RandomPrunedSearch	65
search::RandomSearch	65
sparse::SetOfOperationSpaces	70
problem::Shape	71
loop::Nest::SkewDescriptor	73
sparse::SparseAnalysisState	73
sparse::SparseOptimizationInfo	74
sparse::SpatialExpansion	74
mapspace::SpatialSplitSpace	75
model::Topology::Specs	75
model::Engine::Specs	79
MapperThread::Stats	87
model::BufferLevel::Stats	87
model::Topology::Stats	89
model::SimpleMulticastNetwork::Stats	89
model::LegacyNetwork::Stats	90
Application::Stats	91
model::ReductionTreeNetwork::Stats	91
mapspace::Status	92
TaggedBound< K >	92
loop::Nest::SkewDescriptor::Term	92
problem::Workload	96

Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

AccessStatMatrix	11
A histogram containing accesses and hops for (multicast, scatter) tuples	
AccessStats	12
Access stats (accesses and hops) for a (multicast, scatter) tuple	
sparse::ActionOptimization	13
Application	13
ArchProperties	13
ArchSpace	14
ArchSpaceNode	14
ArchSweepNode	14
model::ArithmeticUnits	15
model::Attribute< T >	16
AxisAlignedHyperRectangle	16
problem::BandedDistribution	17
problem::Bitmask	18
model::BufferLevel	19
CartesianCounter< order >	21
CartesianCounterDynamic	21
CartesianCounterGeneric< T >	22
config::CompoundConfig	22
config::CompoundConfigNode	23
tiling::CompoundTile	26
tiling::CompoundTileNest	26
analysis::CompoundTileNest	26
sparse::CompressionInfo	27
tiling::ComputeInfo	27
analysis::ComputeInfo	28
sparse::ConditionedOnOptimization	28
mapping::Constraints	28
problem::CoordinatePayload	30
tiling::CoordinateSpaceTileInfo	30
tiling::DataMovementInfo	31
analysis::DataMovementInfo	33
problem::DensityDistribution	33
problem::DensityDistributionFactory	34

problem::DensityDistributionSpecs	34
problem::DensityModelIncapability	35
loop::Descriptor	35
DesignSpaceExplorer	36
loop::Nest::SkewDescriptor::Term::DimSpec	36
DynamicArray< T >	37
analysis::ElementState	37
model::Engine	38
model::EvalStatus	39
EvaluationResult	39
search::ExhaustiveSearch	40
sparse::ExplicitReadOptimizationImpact	40
tiling::ExtraTileConstraintInfo	40
Factoradic< T >	41
Factors	41
FailInfo	42
problem::FixedStructuredDistribution	42
Gradient	43
search::HybridSearch	43
problem::HypergeometricDistribution	44
mapspace::IndexFactorizationSpace	45
ISLPointSet	45
model::LegacyNetwork	46
model::Level	47
model::LevelSpecs	48
search::LinearPrunedSearch	48
analysis::LoopState	49
MapperThread	49
Mapping	50
mapspace::MapSpace	51
problem::MetaDataFormat	51
problem::MetaDataFormatFactory	52
problem::MetaDataFormatSpecs	52
problem::MetaDataOccupancyQuery	53
model::Module	54
MultiAAHR	54
loop::Nest	
A nest of loops	55
analysis::NestAnalysis	56
model::Network	56
model::NetworkFactory	57
model::NetworkSpecs	58
problem::OperationPoint	58
problem::OperationSpace	59
PatternGenerator128	59
problem::PerDataSpace< T >	60
sparse::PerDataSpaceCompressionInfo	60
problem::PerFlattenedDimension< T >	61
mapspace::PermutationSpace	61
problem::PerRankMetaDataTileOccupancy	62
Point	62
PointResult	63
ProblemSpace	63
ProblemSpaceNode	64
RandomGenerator128	64
search::RandomPrunedSearch	65
search::RandomSearch	65
model::ReductionTreeNetwork	65

ResidualFactors	67
mapspace::ResidualIndexFactorizationSpace	67
mapspace::Ruby	67
mapspace::RubyPermutationSpace	68
problem::RunLengthEncoding	69
search::SearchAlgorithm	70
SequenceGenerator128	70
sparse::SetOfOperationSpaces	70
problem::Shape	71
model::SimpleMulticastNetwork	72
loop::Nest::SkewDescriptor	73
sparse::SparseAnalysisState	73
sparse::SparseOptimizationInfo	74
sparse::SpatialExpansion	74
mapspace::SpatialSplitSpace	75
model::Topology::Specs	75
problem::CoordinatePayload::Specs	76
problem::UncompressedBitmask::Specs	76
model::SimpleMulticastNetwork::Specs	77
model::ReductionTreeNetwork::Specs	78
model::Engine::Specs	79
problem::FixedStructuredDistribution::Specs	79
problem::UncompressedOffsetPair::Specs	80
problem::RunLengthEncoding::Specs	81
model::LegacyNetwork::Specs	81
model::BufferLevel::Specs	82
problem::Bitmask::Specs	84
problem::BandedDistribution::Specs	85
problem::HypergeometricDistribution::Specs	85
model::ArithmeticUnits::Specs	86
MapperThread::Stats	87
model::BufferLevel::Stats	87
model::Topology::Stats	89
model::SimpleMulticastNetwork::Stats	89
model::LegacyNetwork::Stats	90
Application::Stats	91
model::ReductionTreeNetwork::Stats	91
mapspace::Status	92
TaggedBound< K >	92
loop::Nest::SkewDescriptor::Term	92
model::Topology	93
mapspace::Uber	94
problem::UncompressedBitmask	95
problem::UncompressedOffsetPair	95
problem::Workload	96

Chapter 4

Class Documentation

4.1 AccessStatMatrix Struct Reference

A histogram containing accesses and hops for (multicast, scatter) tuples.

```
#include <nest-analysis-tile-info.hpp>
```

Public Member Functions

- void **clear** ()
- double **TotalAccesses** () const
- double **WeightedAccesses** () const
- void **Accumulate** (const [AccessStatMatrix](#) &other)
- void **Divide** (const std::uint64_t divisor)
- [AccessStats](#) & **at** (std::uint64_t multicast, std::uint64_t scatter)
- [AccessStats](#) & **operator()** (std::uint64_t multicast, std::uint64_t scatter)
- bool **operator==** (const [AccessStatMatrix](#) &other)
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- std::map< std::pair< std::uint64_t, std::uint64_t >, [AccessStats](#) > **stats**
A map from (multicast, scatter) tuple to access stats containing accesses and hops.

Friends

- class **boost::serialization::access**
- std::ostream & **operator<<** (std::ostream &out, const [AccessStatMatrix](#) &m)

4.1.1 Detailed Description

A histogram containing accesses and hops for (multicast, scatter) tuples.

See also

[AccessStats](#)

The documentation for this struct was generated from the following files:

- include/loop-analysis/nest-analysis-tile-info.hpp
- src/loop-analysis/nest-analysis-tile-info.cpp

4.2 AccessStats Struct Reference

Access stats (accesses and hops) for a (multicast, scatter) tuple.

```
#include <nest-analysis-tile-info.hpp>
```

Public Member Functions

- `template<class Archive >`
`void serialize (Archive &ar, const unsigned int version=0)`

Public Attributes

- double `accesses` = 0
Count of parent accesses.
- double `hops` = 0.0
Number of hops to deliver data to all children.

Friends

- class `boost::serialization::access`

4.2.1 Detailed Description

Access stats (accesses and hops) for a (multicast, scatter) tuple.

The documentation for this struct was generated from the following file:

- include/loop-analysis/nest-analysis-tile-info.hpp

4.3 `sparse::ActionOptimization` Struct Reference

Collaboration diagram for `sparse::ActionOptimization`:

Public Attributes

- `ActionOptimizationType` **type**
- `ConditionedOnOptimization` **cond_on_opt**

The documentation for this struct was generated from the following file:

- `include/model/sparse-optimization-info.hpp`

4.4 Application Class Reference

Collaboration diagram for `Application`:

4.5 `ArchProperties` Class Reference

Public Member Functions

- **`ArchProperties`** (const `model::Engine::Specs` &arch_specs)
- void **`DeriveFanouts`** ()
- void **`Construct`** (const `model::Engine::Specs` &arch_specs)
- `std::uint64_t` **`FanoutX`** (unsigned storage_level_id)
- `std::uint64_t` **`FanoutY`** (unsigned storage_level_id)
- `std::uint64_t` **`Fanout`** (unsigned storage_level_id)
- const `std::map< unsigned, std::uint64_t >` & **`FanoutX`** () const
- const `std::map< unsigned, std::uint64_t >` & **`FanoutY`** () const
- const unsigned & **`TemporalToTiling`** (const unsigned l) const
- const unsigned & **`SpatialToTiling`** (const unsigned l) const
- const unsigned & **`TilingToStorage`** (const unsigned l) const
- unsigned **`TilingLevels`** () const
- unsigned **`StorageLevels`** () const
- `model::Engine::Specs` & **`Specs`** ()
- bool **`IsSpatial`** (int level) const
- bool **`IsSpatial2D`** (int level) const
- `std::string` **`StorageLevelName`** (unsigned l) const
- `std::string` **`TilingLevelName`** (unsigned l) const

The documentation for this class was generated from the following files:

- `include/mapping/arch-properties.hpp`
- `src/mapping/arch-properties.cpp`

4.6 ArchSpace Class Reference

Public Member Functions

- **ArchSpace** (std::string n)
- void **InitializeFromFile** (std::string filename)
- void **InitializeFromFileList** (YAML::Node list_yaml)
- void **InitializeFromFileSweep** (YAML::Node sweep_yaml)
- int **GetSize** ()
- [ArchSpaceNode](#) & **GetNode** (int index)

Protected Attributes

- std::string **name_**
- std::vector< [ArchSpaceNode](#) > **architectures_**

The documentation for this class was generated from the following files:

- include/applications/design-space/arch.hpp
- src/applications/design-space/arch.cpp

4.7 ArchSpaceNode Class Reference

Public Member Functions

- **ArchSpaceNode** (std::string n, YAML::Node a)

Public Attributes

- std::string **name_**
- YAML::Node **yaml_**

The documentation for this class was generated from the following files:

- include/applications/design-space/arch.hpp
- src/applications/design-space/arch.cpp

4.8 ArchSweepNode Class Reference

Public Member Functions

- **ArchSweepNode** (std::string n, int min, int max, int step)

Public Attributes

- std::string **name_**
- int **val_curr_**
- int **val_min_**
- int **val_max_**
- int **val_step_size_**

The documentation for this class was generated from the following files:

- include/applications/design-space/arch.hpp
- src/applications/design-space/arch.cpp

4.9 model::ArithmeticUnits Class Reference

Inheritance diagram for model::ArithmeticUnits:

Collaboration diagram for model::ArithmeticUnits:

Classes

- struct [Specs](#)

Public Member Functions

- **ArithmeticUnits** (const [Specs](#) &specs)
- std::shared_ptr< [Level](#) > **Clone** () const override
- [Specs](#) & **GetSpecs** ()
- void **ConnectOperand** (std::shared_ptr< [Network](#) > network)
- void **ConnectResult** (std::shared_ptr< [Network](#) > network)
- std::string **Name** () const override
- double **Energy** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumDataSpaces) const override
- double **Area** () const override
- double **AreaPerInstance** () const override
- std::uint64_t **Cycles** () const override
- std::uint64_t **UtilizedInstances** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumData↵ Spaces) const override
- void **Print** (std::ostream &out) const override
- bool **HardwareReductionSupported** () override
- [EvalStatus](#) **PreEvaluationCheck** (const [problem::PerDataSpace](#)< std::size_t > working_set_sizes, const [tiling::CompoundMask](#) mask, const [problem::Workload](#) *workload, const sparse::PerStorageLevel↵ CompressionInfo per_level_compression_info, const double confidence_threshold, const bool break_on_↵ failure) override
- std::uint64_t **Accesses** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumDataSpaces) const override
- double **CapacityUtilization** () const override
- std::uint64_t **TileSize** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumDataSpaces) const override
- std::uint64_t **UtilizedCapacity** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumData↵ Spaces) const override
- [EvalStatus](#) **Evaluate** (const [tiling::CompoundTile](#) &tile, const [tiling::CompoundMask](#) &mask, const double confidence_threshold, const std::uint64_t compute_cycles, const bool break_on_failure) override
- std::uint64_t **AlgorithmicComputes** () const
- std::uint64_t **ActualComputes** () const
- double **IdealCycles** () const

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) setting, std::uint64_t nElements, bool is_sparse↔_module)
- static void **ValidateTopology** ([ArithmeticUnits::Specs](#) &specs)

Friends

- class **boost::serialization::access**

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/model/arithmetic.hpp
- src/model/arithmetic.cpp

4.10 `model::Attribute< T >` Class Template Reference

Public Member Functions

- **Attribute** (T t)
- **Attribute** (T t, std::string name)
- bool **IsSpecified** () const
- T **Get** () const
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Friends

- class **boost::serialization::access**
- std::ostream & **operator<<** (std::ostream &out, const [Attribute](#) &a)

The documentation for this class was generated from the following file:

- include/model/attribute.hpp

4.11 `AxisAlignedHyperRectangle` Class Reference

Collaboration diagram for `AxisAlignedHyperRectangle`:

Public Member Functions

- **AxisAlignedHyperRectangle** (std::uint32_t order)
- **AxisAlignedHyperRectangle** (std::uint32_t order, const [Point](#) unit)
- **AxisAlignedHyperRectangle** (std::uint32_t order, const [Point](#) min, const [Point](#) max)
- **AxisAlignedHyperRectangle** (std::uint32_t order, const std::vector< std::pair< [Point](#), [Point](#) >> corner_sets)
- **AxisAlignedHyperRectangle** (const [AxisAlignedHyperRectangle](#) &a)
- [AxisAlignedHyperRectangle](#) & **operator=** ([AxisAlignedHyperRectangle](#) other)
- [Point](#) **Min** () const
- [Point](#) **Max** () const
- std::size_t **size** () const
- bool **empty** () const
- void **Reset** ()
- void **Add** (const [Point](#) &p, bool extrude_if_discontiguous=false)
- void **ExtrudeAdd** (const [AxisAlignedHyperRectangle](#) &s)
- void **Add** (const [AxisAlignedHyperRectangle](#) &s, bool extrude_if_discontiguous=false)
- [Gradient](#) **Subtract** (const [AxisAlignedHyperRectangle](#) &s)
- std::vector< [AxisAlignedHyperRectangle](#) > **MultiSubtract** (const [AxisAlignedHyperRectangle](#) &b)
- bool **MergelfAdjacent** (const [Point](#) &p)
- [AxisAlignedHyperRectangle](#) & **operator+=** (const [Point](#) &p)
- [AxisAlignedHyperRectangle](#) & **operator+=** (const [AxisAlignedHyperRectangle](#) &s)
- [AxisAlignedHyperRectangle](#) **operator-** (const [AxisAlignedHyperRectangle](#) &s)
- bool **operator==** (const [AxisAlignedHyperRectangle](#) &s) const
- bool **Contains** (const [Point](#) &p) const
- [Point](#) **GetTranslation** (const [AxisAlignedHyperRectangle](#) &s) const
- void **Translate** (const [Point](#) &p)
- std::vector< double > **Centroid** () const
- void **Print** (std::ostream &out=std::cout) const

Protected Attributes

- std::uint32_t **order_**
- [Point](#) **min_**
- [Point](#) **max_**
- [Gradient](#) **gradient_**

Friends

- void **swap** ([AxisAlignedHyperRectangle](#) &first, [AxisAlignedHyperRectangle](#) &second)
- std::ostream & **operator<<** (std::ostream &out, const [AxisAlignedHyperRectangle](#) &x)

The documentation for this class was generated from the following files:

- include/loop-analysis/point-set-aahr.hpp
- src/loop-analysis/point-set-aahr.cpp

4.12 problem::BandedDistribution Class Reference

Inheritance diagram for problem::BandedDistribution:

Collaboration diagram for problem::BandedDistribution:

Classes

- struct [Specs](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **BandedDistribution** (const [Specs](#) &specs)
- void **SetWorkloadTensorSize** (const PointSet &point_set)
- std::uint64_t **GetWorkloadTensorSize** () const
- std::string **GetDistributionType** () const
- std::uint64_t **GetMaxTileOccupancyByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) &tensor, const double confidence)
- std::uint64_t **GetMaxTileOccupancyByConfidence_LTW** (const std::uint64_t tile_shape, const double confidence)
- std::uint64_t **GetMaxNumElementByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) &fiber_tile, const [tiling::CoordinateSpaceTileInfo](#) &element_tile, const double confidence)
- double **GetMaxTileDensityByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) tile, const double confidence=1.0)
- double **GetMinTileDensity** (const [tiling::CoordinateSpaceTileInfo](#) tile)
- double **GetTileOccupancyProbability** (const [tiling::CoordinateSpaceTileInfo](#) &tile, const std::uint64_t occupancy)
- double **GetExpectedTileOccupancy** (const [tiling::CoordinateSpaceTileInfo](#) tile)

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) density_config)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/density-models/banded-distribution.hpp
- src/workload/density-models/banded-distribution.cpp

4.13 problem::Bitmask Class Reference

Inheritance diagram for problem::Bitmask:

Collaboration diagram for problem::Bitmask:

Classes

- struct [Specs](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **Bitmask** (const [Specs](#) &specs)
- [PerRankMetaDataTileOccupancy](#) **GetOccupancy** (const [MetaDataOccupancyQuery](#) &query) const
- bool **RankCompressed** () const
- bool **CoordinatesImplicit** () const
- std::vector< problem::Shape::FlattenedDimensionID > **GetDimensionIDs** () const
- std::string **GetFormatName** () const
- bool **MetaDataImplicitAsLowestRank** () const
- const [MetaDataFormatSpecs](#) & **GetSpecs** () const

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) metadata_config)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/format-models/bitmask.hpp
- src/workload/format-models/bitmask.cpp

4.14 model::BufferLevel Class Reference

Inheritance diagram for model::BufferLevel:

Collaboration diagram for model::BufferLevel:

Classes

- struct [Specs](#)
- struct [Stats](#)

Public Types

- enum **Technology** { **SRAM**, **DRAM** }

Public Member Functions

- **BufferLevel** (const [Specs](#) &specs)
- std::shared_ptr< [Level](#) > **Clone** () const override
- void **PopulateEnergyPerOp** (unsigned num_ops)
- [Specs](#) & **GetSpecs** ()
- [Stats](#) & **GetStats** ()
- bool **HardwareReductionSupported** () override
- void **ConnectRead** (std::shared_ptr< [Network](#) > network)
- void **ConnectFill** (std::shared_ptr< [Network](#) > network)
- void **ConnectUpdate** (std::shared_ptr< [Network](#) > network)
- void **ConnectDrain** (std::shared_ptr< [Network](#) > network)
- std::shared_ptr< [Network](#) > **GetReadNetwork** ()
- std::shared_ptr< [Network](#) > **GetUpdateNetwork** ()
- [EvalStatus](#) **PreEvaluationCheck** (const [problem::PerDataSpace](#)< std::size_t > working_set_sizes, const [tiling::CompoundMask](#) mask, const [problem::Workload](#) *workload, const [sparse::PerStorageLevel](#)< CompressionInfo per_level_compression_info, const double confidence_threshold, const bool break_on_failure > override
- [EvalStatus](#) **Evaluate** (const [tiling::CompoundTile](#) &tile, const [tiling::CompoundMask](#) &mask, const double confidence_threshold, const std::uint64_t compute_cycles, const bool break_on_failure) override
- void **ComputeEnergyDueToChildLevelOverflow** ([Stats](#) child_level_stats, unsigned data_space_id)
- void **FinalizeBufferEnergy** ()
- double **OperationalIntensity** (std::uint64_t total_ops)
- double **Energy** ([problem::Shape::DataSpaceID](#) pv=[problem::GetShape](#)() ->NumDataSpaces) const override
- std::string **Name** () const override
- double **Area** () const override
- double **AreaPerInstance** () const override
- double **Size** () const
- std::uint64_t **Cycles** () const override
- std::uint64_t **Accesses** ([problem::Shape::DataSpaceID](#) pv=[problem::GetShape](#)() ->NumDataSpaces) const override
- double **CapacityUtilization** () const override
- std::uint64_t **UtilizedCapacity** ([problem::Shape::DataSpaceID](#) pv=[problem::GetShape](#)() ->NumDataSpaces) const override
- std::uint64_t **TileSize** ([problem::Shape::DataSpaceID](#) pv=[problem::GetShape](#)() ->NumDataSpaces) const override
- std::uint64_t **UtilizedInstances** ([problem::Shape::DataSpaceID](#) pv=[problem::GetShape](#)() ->NumDataSpaces) const override
- std::uint64_t **TotalUtilizedBytes** ([problem::Shape::DataSpaceID](#) pv=[problem::GetShape](#)() ->NumDataSpaces) const
- void **Print** (std::ostream &out) const override

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) setting, std::uint64_t n_elements, bool is_sparse_module)
- static void **ParseBufferSpecs** ([config::CompoundConfigNode](#) buffer, std::uint64_t n_elements, [problem::Shape::DataSpaceID](#) pv, [Specs](#) &specs)
- static void **ValidateTopology** ([BufferLevel::Specs](#) &specs)

Friends

- class **boost::serialization::access**
- std::ostream & **operator**<< (std::ostream &out, const [Technology](#) &tech)
- std::ostream & **operator**<< (std::ostream &out, const [BufferLevel](#) &buffer_level)

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/model/buffer.hpp
- src/model/buffer.cpp

4.15 CartesianCounter< order > Class Template Reference

Public Member Functions

- **CartesianCounter** (std::array< uint128_t, order > base={})
- template<typename T >
void **Init** (T base)
- bool **Increment** ()
- std::array< uint128_t, order > **Read** () const
- std::array< uint128_t, order > **Base** () const
- uint128_t **operator[]** (int dim)
- void **Set** (uint128_t n)
- void **Set** (int dim, uint128_t v)
- void **Set** (std::array< uint128_t, order > v)
- uint128_t **EndInteger** () const
- uint128_t **Integer** () const

The documentation for this class was generated from the following file:

- include/util/numeric.hpp

4.16 CartesianCounterDynamic Class Reference

Public Member Functions

- **CartesianCounterDynamic** (unsigned order)
- **CartesianCounterDynamic** (std::vector< uint128_t > base)
- template<typename T >
void **Init** (T base)
- bool **Increment** ()
- std::vector< uint128_t > **Read** () const
- std::vector< uint128_t > **Base** () const
- uint128_t **operator[]** (int dim)
- void **Set** (uint128_t n)
- void **Set** (int dim, uint128_t v)
- void **Set** (std::vector< uint128_t > v)
- uint128_t **EndInteger** () const
- uint128_t **Integer** () const

The documentation for this class was generated from the following file:

- include/util/numeric.hpp

4.17 CartesianCounterGeneric< T > Class Template Reference

Public Member Functions

- **CartesianCounterGeneric** (unsigned order)
- **CartesianCounterGeneric** (std::vector< T > base)
- template<typename S >
void **Init** (S base)
- bool **Increment** ()
- std::vector< T > **Read** () const
- std::vector< T > **Base** () const
- T **operator[]** (int dim)
- void **Set** (T n)
- void **Set** (int dim, T v)
- void **Set** (std::vector< T > v)
- T **EndInteger** () const
- T **Integer** () const

The documentation for this class was generated from the following file:

- include/util/numeric.hpp

4.18 config::CompoundConfig Class Reference

Public Member Functions

- **CompoundConfig** (const char *inputFile)
- **CompoundConfig** (char *inputFile)
- **CompoundConfig** (std::vector< std::string > inputFiles)
- **CompoundConfig** (std::string input, std::string format)
- libconfig::Config & **getLConfig** ()
- YAML::Node & **getYConfig** ()
- [CompoundConfigNode](#) **getRoot** () const
- [CompoundConfigNode](#) **getVariableRoot** () const
- bool **hasLConfig** ()

Public Attributes

- std::vector< std::string > **inFiles**

The documentation for this class was generated from the following files:

- include/compound-config/compound-config.hpp
- src/compound-config/compound-config.cpp

4.19 config::CompoundConfigNode Class Reference

Public Member Functions

- **CompoundConfigNode** (libconfig::Setting *_Inode, YAML::Node _ynode)
- **CompoundConfigNode** (libconfig::Setting *_Inode, YAML::Node _ynode, [CompoundConfig](#) *_cConfig)
- libconfig::Setting & **getLNode** ()
- YAML::Node **getYNode** () const
- [CompoundConfigNode](#) **lookup** (const char *path) const
return compound config node corresponding with path.
- [CompoundConfigNode](#) **lookup** (const std::string &path) const
- bool **lookupValue** (const char *name, bool &value) const
- bool **lookupValue** (const char *name, int &value) const
- bool **lookupValue** (const char *name, unsigned int &value) const
- bool **lookupValueLongOnly** (const char *name, long long &value) const
- bool **lookupValueLongOnly** (const char *name, unsigned long long &value) const
- bool **lookupValue** (const char *name, long long &value) const
- bool **lookupValue** (const char *name, unsigned long long &value) const
- bool **lookupValue** (const char *name, double &value) const
- bool **lookupValue** (const char *name, float &value) const
- bool **lookupValue** (const char *name, const char *&value) const
- bool **lookupValue** (const char *name, std::string &value) const
- std::string **resolve** () const
Resolves the current YNode value to a string.
- bool **instantiateKey** (const char *name)
Instantiates a key in a Map.
- template<typename T >
bool **setScalar** (const T value)
Scalar setter (template).
- template<typename T >
bool **push_back** (const T value)
Creates/appends to Sequence (template).
- bool **lookupValue** (const std::string &name, bool &value) const
- bool **lookupValue** (const std::string &name, int &value) const
- bool **lookupValue** (const std::string &name, unsigned int &value) const
- bool **lookupValue** (const std::string &name, long long &value) const
- bool **lookupValue** (const std::string &name, unsigned long long &value) const
- bool **lookupValue** (const std::string &name, double &value) const
- bool **lookupValue** (const std::string &name, float &value) const
- bool **lookupValue** (const std::string &name, const char *&value) const
- bool **lookupValue** (const std::string &name, std::string &value) const
- bool **instantiateKey** (const std::string &name)
- bool **exists** (const char *name) const
- bool **exists** (const std::string &name) const
- bool **lookupArrayValue** (const char *name, std::vector< std::string > &vectorValue) const
- bool **lookupArrayValue** (const std::string &name, std::vector< std::string > &vectorValue) const
- bool **isList** () const
- bool **isArray** () const
- bool **isMap** () const
- int **getLength** () const
- [CompoundConfigNode](#) **operator[]** (int idx) const
- bool **getArrayValue** (std::vector< std::string > &vectorValue) const
- bool **getMapKeys** (std::vector< std::string > &mapKeys) const

4.19.1 Member Function Documentation

4.19.1.1 instantiateKey()

```
bool config::CompoundConfigNode::instantiateKey (
    const char * name )
```

Instantiates a key in a Map.

Sets the value at a given key to YAML::Null, instantiating it.

Parameters

<i>name</i>	The key we in the Map we want to set to Null.
-------------	---

Returns

Whether the setting was successful.

Postcondition

If return is true the key provided is instantiated.

4.19.1.2 push_back()

```
template<typename T >
template bool config::CompoundConfigNode::push_back (
    const T value )
```

Creates/appends to Sequence (template).

Appends a value onto node.

Template Parameters

<i>T</i>	The C++ type of the value we're attempting to append.
----------	---

Parameters

<i>value</i>	The value we're trying to push on the vector.
--------------	---

Returns

Whether we successfully pushed the value onto the vector.

Postcondition

If we return true, we successfully pushed the vector onto the stack and converted it to a Sequence. If false, we modified nothing.

4.19.1.3 resolve()

```
std::string config::CompoundConfigNode::resolve ( ) const
```

Resolves the current YNode value to a string.

Resolves the current YNode into a string.

Returns

The current YNode as a string.

4.19.1.4 setScalar()

```
template<typename T >  
template bool config::CompoundConfigNode::setScalar (   
    const T value )
```

Scalar setter (template).

Sets the node to a Scalar value.

This is made in a template format for standardization across all Scalar types to reduce the amount of code that needs to be changed upon refactor. In order to avoid linker issues, please add an explicit instantiation at the bottom of the file in order to avoid linker issues.

Template Parameters

<i>T</i>	The C++ type of the Scalar we wish to set.
----------	--

Parameters

<i>scalar</i>	The Scalar we wish to set.
---------------	----------------------------

Returns

Whether or not the scalar we wanted to set was set.

Postcondition

If return is true the set was successful. If return is false, the value at the node was not replaced.

The documentation for this class was generated from the following files:

- `include/compound-config/compound-config.hpp`
- `src/compound-config/compound-config.cpp`

4.20 tiling::CompoundTile Struct Reference

Collaboration diagram for tiling::CompoundTile:

Public Attributes

- [CompoundDataMovementInfo](#) `data_movement_info`
- [ComputeInfo](#) `compute_info`

The documentation for this struct was generated from the following file:

- `include/loop-analysis/tiling-tile-info.hpp`

4.21 tiling::CompoundTileNest Struct Reference

Collaboration diagram for tiling::CompoundTileNest:

Public Attributes

- [CompoundDataMovementNest](#) `compound_data_movement_info_nest`
- [ComputeNest](#) `compute_info_nest`

The documentation for this struct was generated from the following file:

- `include/loop-analysis/tiling-tile-info.hpp`

4.22 analysis::CompoundTileNest Struct Reference

Collaboration diagram for analysis::CompoundTileNest:

Public Attributes

- [CompoundDataMovementNest](#) **compound_data_movement_info_nest**
- [CompoundComputeNest](#) **compound_compute_info_nest**

The documentation for this struct was generated from the following file:

- include/loop-analysis/nest-analysis-tile-info.hpp

4.23 sparse::CompressionInfo Struct Reference

Public Member Functions

- bool **GetDataSpaceCompressionInfo** (unsigned level, unsigned pv, [PerDataSpaceCompressionInfo](#) &info)
- bool **GetStorageLevelCompressionInfo** (unsigned level, [PerStorageLevelCompressionInfo](#) &info)
- bool **GetDataSpaceCompressed** (unsigned level, unsigned pv)

Public Attributes

- std::map< unsigned, [PerStorageLevelCompressionInfo](#) > **per_level_info_map**
- std::vector< [problem::PerDataSpace](#)< bool > > **has_metadata_masks**
- std::vector< [problem::PerDataSpace](#)< bool > > **compressed_masks**
- std::vector< bool > **tile_partition_supported_masks**
- std::vector< bool > **decompression_supported_masks**
- std::vector< bool > **compression_supported_masks**
- bool **all_ranks_default_dense**

The documentation for this struct was generated from the following files:

- include/model/sparse-optimization-info.hpp
- src/model/sparse-optimization-info.cpp

4.24 tiling::ComputeInfo Struct Reference

Public Member Functions

- void **Reset** ()

Public Attributes

- std::uint64_t **replication_factor**
- double **accesses**
- double **avg_replication_factor**
- std::uint64_t **max_replication_factor**
- std::uint64_t **max_x_expansion**
- std::uint64_t **max_y_expansion**
- std::uint64_t **compute_cycles**
- std::uint64_t **max_temporal_iterations**
- std::map< std::string, std::uint64_t > **fine_grained_accesses**

The documentation for this struct was generated from the following file:

- include/loop-analysis/tiling-tile-info.hpp

4.25 analysis::ComputeInfo Struct Reference

Public Member Functions

- void **Reset** ()

Public Attributes

- std::uint64_t **replication_factor**
- double **accesses**
- std::uint64_t **max_temporal_iterations**

The documentation for this struct was generated from the following files:

- include/loop-analysis/nest-analysis-tile-info.hpp
- src/loop-analysis/nest-analysis-tile-info.cpp

4.26 sparse::ConditionedOnOptimization Struct Reference

Public Attributes

- problem::Shape::DataSpaceID **target_dspace_id**
- std::vector< problem::Shape::DataSpaceID > **condition_on_dspace_ids**

The documentation for this struct was generated from the following file:

- include/model/sparse-optimization-info.hpp

4.27 mapping::Constraints Class Reference

Collaboration diagram for mapping::Constraints:

Public Member Functions

- **Constraints** (const [ArchProperties](#) &arch_props, const [problem::Workload](#) &workload)
- const std::map< unsigned, std::map< problem::Shape::FlattenedDimensionID, int > > & **Factors** () const
- const std::map< unsigned, std::map< problem::Shape::FlattenedDimensionID, int > > & **MaxFactors** () const
- const std::map< unsigned, std::pair< std::vector< problem::Shape::FlattenedDimensionID >, std::vector< problem::Shape::FlattenedDimensionID > > > & **Permutations** () const
- const std::map< unsigned, std::uint32_t > & **SpatialSplits** () const
- const std::map< unsigned, std::uint32_t > & **MaxRemainders** () const
- const [problem::PerDataSpace](#)< std::string > & **BypassStrings** () const
- double **MinParallelism** () const
- const std::map< unsigned, double > & **ConfidenceThresholds** () const
- const std::unordered_map< unsigned, [loop::Nest::SkewDescriptor](#) > & **Skews** () const
- const std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > & **NoLinkTransfers** () const
- const std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > & **NoMulticast** () const
- const std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > & **NoTemporalReuse** () const
- void **Generate** ([Mapping](#) *mapping)
- bool **operator**>= (const [Constraints](#) &other) const
- bool **SatisfiedBy** ([Mapping](#) *mapping) const
- void **Parse** ([config::CompoundConfigNode](#) config)
- void **ParseList** ([config::CompoundConfigNode](#) constraints)
- void **ParseSingleConstraint** ([config::CompoundConfigNode](#) target, [config::CompoundConfigNode](#) constraint, [config::CompoundConfigNode](#) attributes)
- unsigned **FindTargetTilingLevel** ([config::CompoundConfigNode](#) constraint, std::string type)
- std::map< problem::Shape::FlattenedDimensionID, int > **ParseFactors** ([config::CompoundConfigNode](#) constraint)
- std::map< problem::Shape::FlattenedDimensionID, int > **ParseMaxFactors** ([config::CompoundConfigNode](#) constraint)
- std::pair< std::vector< problem::Shape::FlattenedDimensionID >, std::vector< problem::Shape::FlattenedDimensionID > > **ParsePermutations** ([config::CompoundConfigNode](#) constraint)
- void **ParseDatatypeBypassSettings** ([config::CompoundConfigNode](#) constraint, unsigned level)

Protected Attributes

- const [ArchProperties](#) & arch_props_
- const [problem::Workload](#) & workload_
- std::map< unsigned, std::map< problem::Shape::FlattenedDimensionID, int > > **factors_**
- std::map< unsigned, std::map< problem::Shape::FlattenedDimensionID, int > > **max_factors_**
- std::map< unsigned, std::pair< std::vector< problem::Shape::FlattenedDimensionID >, std::vector< problem::Shape::FlattenedDimensionID > > > **permutations_**
- std::map< unsigned, std::uint32_t > **spatial_splits_**
- std::map< unsigned, std::uint32_t > **max_remainders_**
- std::map< unsigned, double > **confidence_thresholds_**
- [problem::PerDataSpace](#)< std::string > **bypass_strings_**
- double **min_parallelism_**
- bool **min_parallelism_isset_**
- std::unordered_map< unsigned, [loop::Nest::SkewDescriptor](#) > **skews_**
- std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > **no_link_transfer_**
- std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > **no_multicast_**
- std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > **no_temporal_reuse_**

The documentation for this class was generated from the following files:

- include/mapping/constraints.hpp
- src/mapping/constraints.cpp

4.28 problem::CoordinatePayload Class Reference

Inheritance diagram for problem::CoordinatePayload:

Collaboration diagram for problem::CoordinatePayload:

Classes

- struct [Specs](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **CoordinatePayload** (const [Specs](#) &specs)
- [PerRankMetaDataTileOccupancy](#) **GetOccupancy** (const [MetaDataOccupancyQuery](#) &query) const
- bool **RankCompressed** () const
- bool **CoordinatesImplicit** () const
- std::vector< problem::Shape::FlattenedDimensionID > **GetDimensionIDs** () const
- std::string **GetFormatName** () const
- bool **MetaDataImplicitAsLowestRank** () const
- const [MetaDataFormatSpecs](#) & **GetSpecs** () const

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) metadata_config)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/format-models/coordinate-payload.hpp
- src/workload/format-models/coordinate-payload.cpp

4.29 tiling::CoordinateSpaceTileInfo Struct Reference

Collaboration diagram for tiling::CoordinateSpaceTileInfo:

Public Member Functions

- void **Clear** ()
- void **Set** (const PointSet &tile_mold_point_set, problem::Shape::DataSpaceID data_space_id, [ExtraTileConstraintInfo](#) extra_tile_constraint=[ExtraTileConstraintInfo](#)())
- void **SetMold** (const PointSet &tile_mold_point_set)
- std::uint64_t **GetShape** () const
- PointSet **GetPointSetRepr** () const
- bool **HasExtraConstraintInfo** () const
- [ExtraTileConstraintInfo](#) **GetExtraConstraintInfo** () const

Public Attributes

- problem::Shape::DataSpaceID **dspace_id_**
- [ExtraTileConstraintInfo](#) **extra_tile_constraint_**
- std::shared_ptr< PointSet > **tile_point_set_mold_**
- bool **mold_set_** = false

The documentation for this struct was generated from the following files:

- include/loop-analysis/coordinate-space-tile-info.hpp
- src/loop-analysis/coordinate-space-tile-info.cpp

4.30 tiling::DataMovementInfo Struct Reference

Collaboration diagram for tiling::DataMovementInfo:

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- void **Reset** ()
- void **Validate** ()
- void **SetDensityModel** (std::shared_ptr< [problem::DensityDistribution](#) > tile_density_ptr)
- void **SetTensorRepresentation** (const [sparse::PerDataSpaceCompressionInfo](#) &compression_opt_spec)
- void **SetTensorRepresentation** ()
- std::string **GetDataSpaceName** () const
- bool **GetHasMetaData** () const
- std::string **GetDensityType** () const
- std::string **GetMetaDataFormatName** () const
- std::uint64_t **GetNumMetaDataRanks** () const
- [CoordinateSpaceTileInfo](#) **GetCoordinateSpaceInfo** () const
- [CoordinateSpaceTileInfo](#) **GetChildTileCoordinateSpaceInfo** () const
- std::shared_ptr< [problem::DensityDistribution](#) > **GetTileDensityModel** () const
- std::uint64_t **GetMaxDataTileOccupancyByConfidence** (const double confidence=1.0) const
- double **GetDataTileOccupancyProbability** (const std::uint64_t occupancy) const
- double **GetChildLevelDataTileOccupancyProbability** (const std::uint64_t occupancy) const
- std::uint64_t **GetMinDataTileOccupancy** () const
- MetaDataTileOccupancy **GetMetaDataTileOccupancyGivenDataTile** (const [CoordinateSpaceTileInfo](#) &cur_coord_tile) const
- MetaDataTileOccupancy **GetMaxMetaDataTileOccupancyByConfidence** (const double confidence=1.0) const
- double **GetExpectedAggregatedMetaDataTileOccupancy** () const
- double **GetMaxTileDensityByConfidence** (const double confidence=1.0) const
- double **GetExpectedTileDensity** () const

Public Attributes

- [CoordinateSpaceTileInfo](#) **coord_space_info**
- `std::vector< std::shared_ptr< problem::MetaDataFormat > > metadata_models`
- `std::vector< bool > rank_compressed`
- `std::vector< std::string > rank_formats`
- `bool apply_rank_inner_to_outer`
- `std::size_t size`
- `std::size_t shape`
- `double expected_data_occupancy`
- `MetaDataTileOccupancy expected_metadata_occupancy`
- `problem::Shape::DataSpaceID dataspace_id`
- `std::size_t partition_size`
- `double parent_access_share`
- `bool distributed_multicast`
- [AccessStatMatrix](#) **access_stats**
- `double content_accesses`
- `std::uint64_t fills`
- `std::uint64_t reads`
- `std::uint64_t updates`
- `double temporal_reductions`
- `double link_transfers`
- `double peer_accesses`
- `double peer_fills`
- `PerTileFormatAccesses format_fills`
- `PerTileFormatAccesses format_reads`
- `PerTileFormatAccesses format_updates`
- `std::vector< loop::Descriptor > subnest`
- `std::uint64_t replication_factor`
- `double avg_replication_factor`
- `std::uint64_t max_replication_factor`
- `std::uint64_t max_x_expansion`
- `std::uint64_t max_y_expansion`
- `std::uint64_t fanout`
- `std::uint64_t distributed_fanout`
- `bool is_on_storage_boundary`
- `bool is_master_spatial`
- `std::size_t partition_fraction_denominator`
- `std::shared_ptr< problem::DensityDistribution > tile_density`
- `std::map< std::string, std::uint64_t > fine_grained_data_accesses`
- `std::map< std::string, PerTileFormatAccesses > fine_grained_format_accesses`
- `double expected_density`
- `bool compressed`
- `bool has_metadata`
- `std::vector< std::vector< loop::Descriptor > > metadata_subnest`
- `std::vector< PointSet > metadata_subtile_point_set`
- `std::vector< std::uint64_t > fiber_shape`
- `double child_level_metadata_occupancy_ratio`
- `unsigned parent_level`
- `std::string parent_level_name`
- `unsigned child_level`
- [DataMovementInfo](#) * **child_level_ptr**
- [DataMovementInfo](#) * **parent_level_ptr**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- include/loop-analysis/tiling-tile-info.hpp
- src/loop-analysis/tiling-tile-info.cpp

4.31 analysis::DataMovementInfo Struct Reference

Collaboration diagram for analysis::DataMovementInfo:

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- void **Reset** ()
- void **Validate** ()

Public Attributes

- std::size_t **size**
- bool **distributed_multicast**
- [AccessStatMatrix](#) **access_stats**
- double **link_transfers**
- std::vector< [loop::Descriptor](#) > **subnest**
- std::uint64_t **replication_factor**
- std::uint64_t **fanout**
- std::uint64_t **distributed_fanout**
- bool **is_on_storage_boundary**
- bool **is_master_spatial**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- include/loop-analysis/nest-analysis-tile-info.hpp
- src/loop-analysis/nest-analysis-tile-info.cpp

4.32 problem::DensityDistribution Class Reference

Inheritance diagram for problem::DensityDistribution:

Public Member Functions

- virtual void **SetWorkloadTensorSize** (const PointSet &point_set)=0
- virtual std::uint64_t **GetWorkloadTensorSize** () const =0
- virtual std::string **GetDistributionType** () const =0
- virtual std::uint64_t **GetMaxTileOccupancyByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) &tile, const double confidence=1.0)=0
- virtual std::uint64_t **GetMaxTileOccupancyByConfidence_LTW** (const std::uint64_t tile_shape, const double confidence=1.0)=0
- virtual std::uint64_t **GetMaxNumElementByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) &fiber_tile, const [tiling::CoordinateSpaceTileInfo](#) &element_tile, const double confidence=1.0)=0
- virtual double **GetMaxTileDensityByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) tile, const double confidence=1.0)=0
- virtual double **GetMinTileDensity** (const [tiling::CoordinateSpaceTileInfo](#) tile)=0
- virtual double **GetTileOccupancyProbability** (const [tiling::CoordinateSpaceTileInfo](#) &tile, const std::uint64_t occupancy)=0
- virtual double **GetExpectedTileOccupancy** (const [tiling::CoordinateSpaceTileInfo](#) tile)=0
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/density-models/density-distribution.hpp
- src/workload/density-models/density-distribution.cpp

4.33 problem::DensityDistributionFactory Class Reference

Static Public Member Functions

- static std::shared_ptr< [DensityDistributionSpecs](#) > **ParseSpecs** (config::CompoundConfigNode density_↔ config)
- static std::shared_ptr< [DensityDistribution](#) > **Construct** (std::shared_ptr< [DensityDistributionSpecs](#) > specs)

The documentation for this class was generated from the following files:

- include/workload/density-models/density-distribution-factory.hpp
- src/workload/density-models/density-distribution-factory.cpp

4.34 problem::DensityDistributionSpecs Struct Reference

Inheritance diagram for problem::DensityDistributionSpecs:

Public Member Functions

- virtual std::shared_ptr< [DensityDistributionSpecs](#) > **Clone** () const =0
- virtual const std::string **Type** () const =0
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- std::string **type** = "UNSET"

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- include/workload/density-models/density-distribution.hpp
- src/workload/density-models/density-distribution.cpp

4.35 problem::DensityModelIncapability Class Reference

Inheritance diagram for problem::DensityModelIncapability:

Collaboration diagram for problem::DensityModelIncapability:

The documentation for this class was generated from the following file:

- include/workload/density-models/density-distribution.hpp

4.36 loop::Descriptor Class Reference

Public Member Functions

- **Descriptor** (const problem::Shape::FlattenedDimensionID _dimension, const int _start, const int _end, const int _stride, const spacetime::Dimension _spacetime_dimension, const int _residual_end=0)
- **Descriptor** (const problem::Shape::FlattenedDimensionID _dimension, const int _end, const spacetime::Dimension _spacetime_dimension=spacetime::Dimension::Time, const int _residual_end=0)
- bool **operator==** (const [Descriptor](#) &d) const
- void **Print** (std::ostream &out, bool long_form=true) const
- void **PrintWhoop** (std::ostream &out, int storage_level, std::vector< problem::Shape::FlattenedDimensionID > &dimids, std::vector< std::string > &dimnames, std::vector< int > &dimbounds, std::vector< std::string > &varnames) const
- std::string **PrintCompact** () const
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- problem::Shape::FlattenedDimensionID **dimension**
- int **start**
- int **end**
- int **residual_end**
- int **stride**
- spacetime::Dimension **spacetime_dimension**

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/mapping/loop.hpp
- src/mapping/loop.cpp

4.37 DesignSpaceExplorer Class Reference

Public Member Functions

- **DesignSpaceExplorer** (std::string problemfile, std::string archfile)
- void **Run** ()

Protected Attributes

- std::string **problemspec_filename_**
- std::string **archspect_filename_**
- std::vector< [PointResult](#) > **designs_**
- std::vector< [Application](#) * > **mappers_**

The documentation for this class was generated from the following files:

- include/applications/design-space/design-space.hpp
- src/applications/design-space/design-space.cpp

4.38 loop::Nest::SkewDescriptor::Term::DimSpec Struct Reference

Public Attributes

- problem::Shape::FlattenedDimensionID **dimension** = problem::GetShape()->NumFlattenedDimensions
- bool **is_spatial**

The documentation for this struct was generated from the following file:

- include/mapping/nest.hpp

4.39 `DynamicArray< T >` Class Template Reference

Inheritance diagram for `DynamicArray< T >`:

Public Member Functions

- `DynamicArray` (`size_t` size)
- `DynamicArray` (`const DynamicArray` &other)
- `DynamicArray` (`std::initializer_list< T >` l)
- `DynamicArray< T >` & `operator=` (`DynamicArray` other)
- `size_t` `size` ()
- `void` `clear` ()
- `T` & `operator[]` (`size_t` i)
- `const T` & `operator[]` (`size_t` i) `const`
- `T` & `at` (`size_t` i)
- `const T` & `at` (`size_t` i) `const`
- `T *` `data` ()
- `const T *` `data` () `const`
- `T *` `begin` ()
- `const T *` `begin` () `const`
- `const T *` `cbegin` () `const`
- `T *` `end` ()
- `const T *` `end` () `const`
- `const T *` `cend` () `const`
- `void` `fill` (`const T` &value)

Friends

- `void` `swap` (`DynamicArray` &first, `DynamicArray` &second)

The documentation for this class was generated from the following file:

- `include/util/dynamic-array.hpp`

4.40 `analysis::ElementState` Struct Reference

Collaboration diagram for `analysis::ElementState`:

Public Member Functions

- `ElementState` (`problem::Workload` &workload)
- `void` `Reset` ()

Public Attributes

- [problem::OperationSpace](#) **last_point_set**
- [problem::PerDataSpace](#)< [Point](#) > **last_translations**
- [problem::PerDataSpace](#)< std::size_t > **max_size**
- [problem::PerDataSpace](#)< [AccessStatMatrix](#) > **access_stats**
- [problem::PerDataSpace](#)< std::map< unsigned long, unsigned long > > **delta_histograms**
- std::unordered_map< std::uint64_t, [problem::OperationSpace](#) > **prev_spatial_deltas**
- [problem::PerDataSpace](#)< unsigned long > **link_transfers**

Static Public Attributes

- static constexpr std::uint64_t **MAX_TIME_LAPSE** = 1

The documentation for this struct was generated from the following files:

- include/loop-analysis/loop-state.hpp
- src/loop-analysis/loop-state.cpp

4.41 model::Engine Class Reference

Inheritance diagram for model::Engine:

Collaboration diagram for model::Engine:

Classes

- struct [Specs](#)

Public Member Functions

- void **Spec** ([Specs](#) specs)
- const [Topology](#) & **GetTopology** () const
- std::vector< [EvalStatus](#) > **PreEvaluationCheck** (const [Mapping](#) &mapping, [problem::Workload](#) &workload, [sparse::SparseOptimizationInfo](#) *sparse_optimizations, bool break_on_failure=true)
- std::vector< [EvalStatus](#) > **Evaluate** ([Mapping](#) &mapping, [problem::Workload](#) &workload, [sparse::SparseOptimizationInfo](#) *sparse_optimizations, bool break_on_failure=true)
- double **Energy** () const
- double **Area** () const
- std::uint64_t **Cycles** () const
- double **Utilization** () const

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) setting, bool is_sparse_topology)

Friends

- class **boost::serialization::access**
- std::ostream & **operator**<< (std::ostream &out, [Engine](#) &engine)

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/model/engine.hpp
- src/model/engine.cpp

4.42 model::EvalStatus Struct Reference

Public Attributes

- bool **success**
- std::string **fail_reason**

The documentation for this struct was generated from the following file:

- include/model/level.hpp

4.43 EvaluationResult Struct Reference

Collaboration diagram for EvaluationResult:

Public Member Functions

- bool **UpdateIfBetter** (const [EvaluationResult](#) &other, const std::vector< std::string > &metrics)
- bool **UpdateIfEqual** (const [EvaluationResult](#) &other, const std::vector< std::string > &metrics)

Public Attributes

- bool **valid** = false
- [Mapping](#) **mapping**
- [model::Topology::Stats](#) **stats**

The documentation for this struct was generated from the following files:

- include/applications/mapper/mapper-thread.hpp
- src/applications/mapper/mapper-thread.cpp

4.44 search::ExhaustiveSearch Class Reference

Inheritance diagram for search::ExhaustiveSearch:

Collaboration diagram for search::ExhaustiveSearch:

Public Member Functions

- **ExhaustiveSearch** ([config::CompoundConfigNode](#) config, [mapspace::MapSpace](#) *mapspace)
- bool **IncrementRecursive_** (int position=0)
- bool **Next** ([mapspace::ID](#) &mapping_id)
- void **Report** (Status status, double cost=0)

The documentation for this class was generated from the following files:

- include/search/exhaustive.hpp
- src/search/exhaustive.cpp

4.45 sparse::ExplicitReadOptimizationImpact Struct Reference

Public Attributes

- DataSpaceID **target_dspace_id**
- std::vector< DataSpaceID > **condition_on_dspace_ids**
- unsigned **target_dspace_level**
- double **optimization_prob**
- double **expected_target_tile_occupancy**
- std::uint64_t **spatial_instances**

The documentation for this struct was generated from the following file:

- src/sparse-analysis/storage-gs-analyzer.cpp

4.46 tiling::ExtraTileConstraintInfo Struct Reference

Public Member Functions

- void **Set** (const std::uint64_t shape, const std::uint64_t occupancy)
- void **SetMold** (const PointSet &tile_point_set_mold)
- std::uint64_t **GetShape** () const
- std::uint64_t **GetOccupancy** () const
- PointSet **GetPointSetMold** () const

Public Attributes

- `std::uint64_t` **shape_**
- `std::uint64_t` **occupancy_**
- `std::shared_ptr< PointSet >` **tile_point_set_mold_**
- `bool` **set_** = false
- `bool` **mold_set_** = false

The documentation for this struct was generated from the following files:

- `include/loop-analysis/coordinate-space-tile-info.hpp`
- `src/loop-analysis/coordinate-space-tile-info.cpp`

4.47 Factoradic< T > Class Template Reference

Public Member Functions

- `std::uint64_t` **Factorial** (`std::uint64_t` n)
- `void` **Permute** (`T` *buffer, `std::size_t` length, `std::uint64_t` index)

The documentation for this class was generated from the following file:

- `include/util/numeric.hpp`

4.48 Factors Class Reference

Public Member Functions

- **Factors** (`const unsigned long` n, `const int` order)
- **Factors** (`const unsigned long` n, `const int` order, `std::map< unsigned, unsigned long >` given)
- `void` **PruneMax** (`std::map< unsigned, unsigned long >` &max)
- `std::vector< unsigned long >` & **operator[]** (`int` index)
- `std::size_t` **size** ()
- `void` **Print** ()
- `void` **PrintAllFactors** ()
- `void` **PrintCoFactors** ()

Friends

- `std::ostream` & **operator<<** (`std::ostream` &out, `const` [Factors](#) &f)

The documentation for this class was generated from the following files:

- `include/util/numeric.hpp`
- `src/util/numeric.cpp`

4.49 FailInfo Struct Reference

Collaboration diagram for FailInfo:

Public Attributes

- uint128_t **count** = 0
- [Mapping](#) **mapping**
- std::string **reason**

The documentation for this struct was generated from the following file:

- include/applications/mapper/mapper-thread.hpp

4.50 problem::FixedStructuredDistribution Class Reference

Inheritance diagram for problem::FixedStructuredDistribution:

Collaboration diagram for problem::FixedStructuredDistribution:

Classes

- struct [Specs](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **FixedStructuredDistribution** (const [Specs](#) &specs)
- void **SetWorkloadTensorSize** (const PointSet &point_set)
- std::uint64_t **GetWorkloadTensorSize** () const
- std::string **GetDistributionType** () const
- std::uint64_t **GetMaxTileOccupancyByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) &tensor, const double confidence)
- std::uint64_t **GetMaxTileOccupancyByConfidence_LTW** (const std::uint64_t tile_shape, const double confidence)
- std::uint64_t **GetMaxNumElementByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) &fiber_tile, const [tiling::CoordinateSpaceTileInfo](#) &element_tile, const double confidence)
- double **GetMaxTileDensityByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) tile, const double confidence=1.0)
- double **GetMinTileDensity** (const [tiling::CoordinateSpaceTileInfo](#) tile)
- double **GetTileOccupancyProbability** (const [tiling::CoordinateSpaceTileInfo](#) &tile, const std::uint64_t occupancy)
- double **GetExpectedTileOccupancy** (const [tiling::CoordinateSpaceTileInfo](#) tile)

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) density_config)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/density-models/fixed-structured-distribution.hpp
- src/workload/density-models/fixed-structured-distribution.cpp

4.51 Gradient Struct Reference

Public Member Functions

- **Gradient** (std::uint32_t _order)
- void **Reset** ()
- std::int32_t **Sign** () const
- void **Print** (std::ostream &out=std::cout) const

Public Attributes

- std::uint32_t **order**
- std::uint32_t **dimension**
- std::int32_t **value**

Friends

- std::ostream & **operator**<< (std::ostream &out, const [Gradient](#) &g)

The documentation for this struct was generated from the following files:

- include/loop-analysis/point-set-aahr.hpp
- src/loop-analysis/point-set-aahr.cpp

4.52 search::HybridSearch Class Reference

Inheritance diagram for search::HybridSearch:

Collaboration diagram for search::HybridSearch:

Public Member Functions

- **HybridSearch** ([config::CompoundConfigNode](#) config, [mapspace::MapSpace](#) *mapspace, unsigned id)
- bool **IncrementRecursive**_ (int position=0)
- bool **Next** ([mapspace::ID](#) &mapping_id)
- void **Report** (Status status, double cost=0)

The documentation for this class was generated from the following files:

- include/search/hybrid.hpp
- src/search/hybrid.cpp

4.53 problem::HypergeometricDistribution Class Reference

Inheritance diagram for problem::HypergeometricDistribution:

Collaboration diagram for problem::HypergeometricDistribution:

Classes

- struct [Specs](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **HypergeometricDistribution** (const [Specs](#) &specs)
- void **SetWorkloadTensorSize** (const PointSet &point_set)
- std::uint64_t **GetWorkloadTensorSize** () const
- std::string **GetDistributionType** () const
- std::uint64_t **GetMaxTileOccupancyByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) &tensor, const double confidence)
- std::uint64_t **GetMaxTileOccupancyByConfidence_LTW** (const std::uint64_t tile_shape, const double confidence)
- std::uint64_t **GetMaxNumElementByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) &fiber_tile, const [tiling::CoordinateSpaceTileInfo](#) &element_tile, const double confidence)
- double **GetMaxTileDensityByConfidence** (const [tiling::CoordinateSpaceTileInfo](#) tile, const double confidence=1.0)
- double **GetMinTileDensity** (const [tiling::CoordinateSpaceTileInfo](#) tile)
- double **CalculateProbability** (const std::uint64_t nnz_vals, const std::uint64_t r, const std::uint64_t n, const std::uint64_t N) const
- double **GetTileOccupancyProbability** (const [tiling::CoordinateSpaceTileInfo](#) &tile, const std::uint64_t occupancy)
- double **GetExpectedTileOccupancy** (const [tiling::CoordinateSpaceTileInfo](#) tile)

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) density_config)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/density-models/hypergeometric-distribution.hpp
- src/workload/density-models/hypergeometric-distribution.cpp

4.54 mapspace::IndexFactorizationSpace Class Reference

Public Member Functions

- void **Init** (const [problem::Workload](#) &workload, std::map< problem::Shape::FlattenedDimensionID, std::uint64_t > cofactors_order, std::map< problem::Shape::FlattenedDimensionID, std::map< unsigned, unsigned long >> prefactors=std::map< problem::Shape::FlattenedDimensionID, std::map< unsigned, unsigned long >>(), std::map< problem::Shape::FlattenedDimensionID, std::map< unsigned, unsigned long >> maxfactors=std::map< problem::Shape::FlattenedDimensionID, std::map< unsigned, unsigned long >>())
- unsigned long **GetFactor** (uint128_t nest_id, problem::Shape::FlattenedDimensionID dim, unsigned level)
- uint128_t **Size** () const

The documentation for this class was generated from the following files:

- include/mapspaces/subspaces.hpp
- src/mapspaces/subspaces.cpp

4.55 ISLPointSet Class Reference

Public Member Functions

- **ISLPointSet** (std::uint32_t order)
- **ISLPointSet** (std::uint32_t order, isl_set *set)
- **ISLPointSet** (std::uint32_t order, const [Point](#) unit)
- **ISLPointSet** (std::uint32_t order, const [Point](#) min, const [Point](#) max)
- **ISLPointSet** (const [ISLPointSet](#) &a)
- [ISLPointSet](#) & **operator=** ([ISLPointSet](#) other)
- std::size_t **size** () const
- bool **empty** () const
- void **Reset** ()
- [ISLPointSet](#) & **operator+=** (const [Point](#) &p)
- [ISLPointSet](#) **operator-** (const [ISLPointSet](#) &s)
- bool **operator==** (const [ISLPointSet](#) &s) const
- [Point](#) **GetTranslation** (const [ISLPointSet](#) &s) const
- void **Translate** (const [Point](#) &p)
- void **Print** (std::ostream &out=std::cout) const

Protected Member Functions

- isl_point * **ToISL** (const [Point](#) p)
- isl_ctx * **Context** ()

Protected Attributes

- std::uint32_t **order_**
- isl_set * **set_**

Static Protected Attributes

- static std::mutex **mutex**
- static std::unordered_map< pthread_t, isl_ctx * > **contexts**
- static std::unordered_map< pthread_t, isl_printer * > **consoles**

Friends

- void **swap** ([ISLPointSet](#) &first, [ISLPointSet](#) &second)

The documentation for this class was generated from the following files:

- include/loop-analysis/point-set-isl.hpp
- src/loop-analysis/point-set-isl.cpp

4.56 model::LegacyNetwork Class Reference

Inheritance diagram for model::LegacyNetwork:

Collaboration diagram for model::LegacyNetwork:

Classes

- struct [Specs](#)
- struct [Stats](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **LegacyNetwork** (const [Specs](#) &specs)
- std::shared_ptr< [Network](#) > **Clone** () const override
- [Specs](#) & **GetSpecs** ()
- void **ConnectSource** (std::weak_ptr< [Level](#) > source) override
- void **ConnectSink** (std::weak_ptr< [Level](#) > sink) override
- void **SetName** (std::string name) override
- std::string **Name** () const override
- void **AddConnectionType** (ConnectionType ct) override
- void **ResetConnectionType** () override
- bool **DistributedMulticastSupported** () const override
- void **SetTileWidth** (double width_um) override
- [EvalStatus](#) **Evaluate** (const [tiling::CompoundTile](#) &tile, const bool break_on_failure) override
- [EvalStatus](#) **ComputeAccesses** (const [tiling::CompoundDataMovementInfo](#) &tile, const bool break_on_failure)
- void **ComputeNetworkEnergy** ()
- void **ComputeSpatialReductionEnergy** ()
- void **ComputePerformance** ()
- std::uint64_t **WordBits** () const override
- std::uint64_t **FillLatency** () const override
- std::uint64_t **DrainLatency** () const override
- void **SetFillLatency** (std::uint64_t fill_latency) override
- void **SetDrainLatency** (std::uint64_t drain_latency) override
- void **Print** (std::ostream &out) const override
- **STAT_ACCESSOR_HEADER** (double, NetworkEnergy)
- **STAT_ACCESSOR_HEADER** (double, SpatialReductionEnergy)
- **STAT_ACCESSOR_HEADER** (double, Energy) override

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) network, std::size_t n_elements, bool is_sparse↵_module)
- static double **WireEnergyPerHop** (std::uint64_t word_bits, const double hop_distance, double wire_↵energy_override)
- static double **NumHops** (std::uint32_t multicast_factor, std::uint32_t fanout)

Public Attributes

- [Stats](#) stats_

Friends

- class **boost::serialization::access**

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/model/network-legacy.hpp
- src/model/network-legacy.cpp

4.57 model::Level Class Reference

Inheritance diagram for model::Level:

Collaboration diagram for model::Level:

Public Member Functions

- virtual std::shared_ptr< [Level](#) > **Clone** () const =0
- virtual bool **HardwareReductionSupported** ()=0
- virtual [EvalStatus](#) **PreEvaluationCheck** (const [problem::PerDataSpace](#)< std::size_t > working_set_sizes, const [tiling::CompoundMask](#) mask, const [problem::Workload](#) *workload, const sparse::PerStorageLevel↵CompressionInfo per_level_compression_info, const double confidence_threshold, const bool break_on_↵failure)=0
- virtual [EvalStatus](#) **Evaluate** (const [tiling::CompoundTile](#) &tile, const [tiling::CompoundMask](#) &mask, const double confidence_threshold, const std::uint64_t compute_cycles, const bool break_on_failure)=0
- virtual double **Energy** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumDataSpaces) const =0
- virtual std::string **Name** () const =0
- virtual double **Area** () const =0
- virtual double **AreaPerInstance** () const =0
- virtual std::uint64_t **Cycles** () const =0
- virtual std::uint64_t **Accesses** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumData↵Spaces) const =0
- virtual double **CapacityUtilization** () const =0
- virtual std::uint64_t **UtilizedCapacity** (problem::Shape::DataSpaceID pv=problem::GetShape() ->Num↵DataSpaces) const =0
- virtual std::uint64_t **TileSize** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumDataSpaces) const =0
- virtual std::uint64_t **UtilizedInstances** (problem::Shape::DataSpaceID pv=problem::GetShape() ->Num↵DataSpaces) const =0
- virtual void **Print** (std::ostream &out) const =0
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Friends

- class **boost::serialization::access**
- std::ostream & **operator**<< (std::ostream &out, const [Level](#) &level)

Additional Inherited Members

The documentation for this class was generated from the following file:

- include/model/level.hpp

4.58 model::LevelSpecs Struct Reference

Inheritance diagram for model::LevelSpecs:

Public Member Functions

- virtual std::shared_ptr< [LevelSpecs](#) > **Clone** () const =0
- virtual const std::string **Type** () const =0
- virtual void **UpdateOpEnergyViaERT** (const std::map< std::string, double > &ERT_entries, const double max_energy)=0
- virtual void **UpdateAreaViaART** (const double component_area)=0
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- std::string **level_name**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/model/level.hpp

4.59 search::LinearPrunedSearch Class Reference

Inheritance diagram for search::LinearPrunedSearch:

Collaboration diagram for search::LinearPrunedSearch:

Public Member Functions

- **LinearPrunedSearch** ([config::CompoundConfigNode](#) config, [mapspace::MapSpace](#) *mapspace, unsigned id)
- bool **IncrementRecursive**_ (int position=0)
- bool **Next** ([mapspace::ID](#) &mapping_id)
- void **Report** (Status status, double cost=0)

The documentation for this class was generated from the following files:

- include/search/linear-pruned.hpp
- src/search/linear-pruned.cpp

4.60 analysis::LoopState Class Reference

Collaboration diagram for analysis::LoopState:

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- int **level**
- [loop::Descriptor](#) **descriptor**
- std::map< std::vector< unsigned >, [ElementState](#) > **live_state**

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/loop-analysis/loop-state.hpp
- src/loop-analysis/loop-state.cpp

4.61 MapperThread Class Reference

Classes

- struct [Stats](#)

Public Member Functions

- **MapperThread** (unsigned thread_id, [search::SearchAlgorithm](#) *search, [mapspace::MapSpace](#) *mapspace, std::mutex *mutex, uint128_t search_size, std::uint32_t timeout, std::uint32_t victory_condition, uint128_t sync_interval, uint128_t log_interval, bool log_oaves, bool log_oaves_mappings, bool log_stats, bool log_suboptimal, std::ostream &log_stream, std::ostream &oaves_csv_file, std::string oaves_prefix, bool live_status, bool diagnostics_on, bool penalize_consecutive_bypass_fails, std::vector< std::string > optimization_metrics, [model::Engine::Specs](#) arch_specs, [problem::Workload](#) &workload, [sparse::SparseOptimizationInfo](#) *sparse_optimizations, [EvaluationResult](#) *best)
- void **Start** ()
- void **Join** ()
- const [Stats](#) & **GetStats** () const
- void **Run** ()

The documentation for this class was generated from the following files:

- include/applications/mapper/mapper-thread.hpp
- src/applications/mapper/mapper-thread.cpp

4.62 Mapping Struct Reference

Collaboration diagram for Mapping:

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- void **FormatAsConstraints** (libconfig::Setting &mapspace)
- void **FormatAsLibConfig** (libconfig::Setting &mapping, const std::vector< std::string > &storage_level_names)
- void **FormatAsYaml** (YAML::Emitter &yaml_mapping, const std::vector< std::string > &storage_level_names)
- void **PrintAsConstraints** (std::string filename)
- void **PrettyPrint** (std::ostream &out, const std::vector< std::string > &storage_level_names, const std::vector< [problem::PerDataSpace](#)< std::uint64_t >> &utilized_capacities={}, const std::vector< [problem::PerDataSpace](#)< std::uint64_t >> &tile_sizes={}, const std::string _indent="")
- void **PrintWhoopNest** (std::ostream &out, const std::vector< std::string > &storage_level_names, const std::vector< [problem::PerDataSpace](#)< std::uint64_t >> &tile_sizes, const std::vector< [problem::PerDataSpace](#)< std::uint64_t >> &utilized_instances)
- std::string **PrintCompact** ()
- void **PrintTenssella** (std::ostream &out)

Public Attributes

- uint128_t id
- [loop::Nest](#) loop_nest
- [loop::Nest](#) complete_loop_nest
- [tiling::CompoundMaskNest](#) datatype_bypass_nest
- std::map< unsigned, double > confidence_thresholds
- std::map< unsigned, std::uint64_t > fanoutX_map
- std::map< unsigned, std::uint64_t > fanoutY_map

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- include/mapping/mapping.hpp
- src/mapping/mapping.cpp

4.63 mapspace::MapSpace Class Reference

Inheritance diagram for mapspace::MapSpace:

Collaboration diagram for mapspace::MapSpace:

Public Member Functions

- **MapSpace** ([model::Engine::Specs](#) arch_specs, const [problem::Workload](#) &workload)
- virtual std::vector< [MapSpace](#) * > **Split** (std::uint64_t num_splits)=0
- virtual void **InitPruned** (uint128_t local_index_factorization_id)=0
- virtual std::vector< [Status](#) > **ConstructMapping** ([ID](#) mapping_id, [Mapping](#) *mapping, bool break_on_↔ failure=true)=0
- std::vector< [Status](#) > **ConstructMapping** (const uint128_t mapping_id, [Mapping](#) *mapping, bool break_↔ on_failure=true)
- uint128_t **Size** (Dimension dim)
- uint128_t **Size** ()
- std::array< uint128_t, int(Dimension::Num)> **AllSizes** ()

Protected Attributes

- [model::Engine::Specs](#) arch_specs_
- const [problem::Workload](#) & workload_
- std::array< uint128_t, int(Dimension::Num)> size_

The documentation for this class was generated from the following file:

- include/mapspaces/mapspace-base.hpp

4.64 problem::MetaDataFormat Class Reference

Inheritance diagram for problem::MetaDataFormat:

Public Member Functions

- virtual [PerRankMetaDataTileOccupancy](#) **GetOccupancy** (const [MetaDataOccupancyQuery](#) &query) const =0
- virtual bool **RankCompressed** () const =0
- virtual bool **CoordinatesImplicit** () const =0
- virtual std::vector< problem::Shape::FlattenedDimensionID > **GetDimensionIDs** () const =0
- virtual std::string **GetFormatName** () const =0
- virtual bool **MetaDataImplicitAsLowestRank** () const =0
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/format-models/metadata-format.hpp
- src/workload/format-models/metadata-format.cpp

4.65 problem::MetaDataFormatFactory Class Reference

Static Public Member Functions

- static std::shared_ptr< [MetaDataFormatSpecs](#) > **ParseSpecs** ([config::CompoundConfigNode](#) metadata↔
_rank_config)
- static std::shared_ptr< [MetaDataFormat](#) > **Construct** (std::shared_ptr< [MetaDataFormatSpecs](#) > specs)

The documentation for this class was generated from the following files:

- include/workload/format-models/metadata-format-factory.hpp
- src/workload/format-models/metadata-format-factory.cpp

4.66 problem::MetaDataFormatSpecs Struct Reference

Inheritance diagram for problem::MetaDataFormatSpecs:

Public Member Functions

- virtual std::shared_ptr< [MetaDataFormatSpecs](#) > **Clone** () const =0
- virtual const std::string **Name** () const =0
- virtual bool **RankCompressed** () const =0
- virtual std::vector< problem::Shape::FlattenedDimensionID > **DimensionIDs** () const =0
- virtual std::uint32_t **MetaDataWordBits** () const =0
- virtual std::uint32_t **PayloadWordBits** () const =0
- virtual void **SetMetaDataWordBits** (std::uint32_t word_bits)=0
- virtual void **SetPayloadWordBits** (std::uint32_t word_bits)=0
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- `std::string name` = "UNSET"
- `std::uint32_t payload_word_bits` = `std::numeric_limits<std::uint32_t>::max()`
- `std::uint32_t metadata_word_bits` = `std::numeric_limits<std::uint32_t>::max()`

Friends

- class `boost::serialization::access`

The documentation for this struct was generated from the following files:

- `include/workload/format-models/metadata-format.hpp`
- `src/workload/format-models/metadata-format.cpp`

4.67 problem::MetaDataOccupancyQuery Struct Reference

Collaboration diagram for `problem::MetaDataOccupancyQuery`:

Public Member Functions

- **MetaDataOccupancyQuery** (`std::uint64_t max_num_of_fibers`, `std::uint64_t cur_rank_fiber_shape`, `tiling::CoordinateSpaceTileInfo cur_rank_coord_tile`, `tiling::CoordinateSpaceTileInfo next_rank_coord_tile`, `std::shared_ptr< problem::DensityDistribution > density_ptr`)
- **MetaDataOccupancyQuery** (`std::uint64_t max_num_of_fibers`, `std::uint64_t cur_rank_fiber_shape`, `tiling::CoordinateSpaceTileInfo cur_rank_coord_tile`, `tiling::CoordinateSpaceTileInfo next_rank_coord_tile`, `std::shared_ptr< problem::DensityDistribution > density_ptr`, `double confidence`)
- `std::uint64_t MaxNumFibers` () const
- `tiling::CoordinateSpaceTileInfo CurRankCoordTile` () const
- `tiling::CoordinateSpaceTileInfo NextRankCoordTile` () const
- `std::shared_ptr< problem::DensityDistribution > TileDensityPtr` () const
- `std::shared_ptr< problem::DensityDistribution > NextRankTileDensityPtr` () const
- `std::uint64_t CurRankFiberShape` () const

Public Attributes

- `std::uint64_t max_number_of_fibers`
- `std::uint64_t cur_rank_fiber_shape`
- `tiling::CoordinateSpaceTileInfo cur_rank_coord_tile`
- `tiling::CoordinateSpaceTileInfo next_rank_coord_tile`
- `std::shared_ptr< problem::DensityDistribution > tile_density_ptr`
- `double confidence` = 1.0

The documentation for this struct was generated from the following files:

- `include/workload/format-models/metadata-format.hpp`
- `src/workload/format-models/metadata-format.cpp`

4.68 model::Module Class Reference

Inheritance diagram for model::Module:

Public Member Functions

- bool **IsSpecced** () const
- bool **IsEvaluated** () const
- virtual void **Reset** ()

Protected Attributes

- bool **is_specced_** = false
- bool **is_evaluated_** = false

The documentation for this class was generated from the following files:

- include/model/model-base.hpp
- src/model/model-base.cpp

4.69 MultiAAHR Class Reference

Public Member Functions

- **MultiAAHR** (std::uint32_t order)
- **MultiAAHR** (std::uint32_t order, const [Point](#) unit)
- **MultiAAHR** (std::uint32_t order, const [Point](#) min, const [Point](#) max)
- **MultiAAHR** (std::uint32_t order, const std::vector< std::pair< [Point](#), [Point](#) >> corner_sets)
- **MultiAAHR** (const [MultiAAHR](#) &a)
- [MultiAAHR](#) & **operator=** ([MultiAAHR](#) other)
- std::size_t **size** () const
- bool **empty** () const
- std::uint32_t **numAAHRs** () const
- void **Reset** ()
- void **Subtract** (const [MultiAAHR](#) &other)
- [MultiAAHR](#) & **operator+=** (const [Point](#) &p)
- [MultiAAHR](#) & **operator+=** (const [MultiAAHR](#) &s)
- [MultiAAHR](#) **operator-** (const [MultiAAHR](#) &other)
- bool **operator==** (const [MultiAAHR](#) &s) const
- [Point](#) **GetTranslation** (const [MultiAAHR](#) &s) const
- void **Translate** (const [Point](#) &p)
- std::vector< [AxisAlignedHyperRectangle](#) > **GetAAHRs** () const

Protected Attributes

- std::uint32_t **order_**
- std::vector< [AxisAlignedHyperRectangle](#) > **aahrs_**

Friends

- void **swap** ([MultiAAHR](#) &first, [MultiAAHR](#) &second)
- std::ostream & **operator**<< (std::ostream &out, const [MultiAAHR](#) &m)

The documentation for this class was generated from the following files:

- include/loop-analysis/point-set-multi-aahr.hpp
- src/loop-analysis/point-set-multi-aahr.cpp

4.70 loop::Nest Class Reference

A nest of loops.

```
#include <nest.hpp>
```

Classes

- struct [SkewDescriptor](#)

Public Member Functions

- bool **operator**== (const [Nest](#) &n) const
- void **AddLoop** ([Descriptor](#) descriptor)
- void **AddLoop** (problem::Shape::FlattenedDimensionID dimension, int start, int end, int stride, spacetime↵::Dimension spacetime_dimension, int residual_end=0)
- bool **AddStorageTilingBoundary** ()
- void **PrettyPrint** (std::ostream &out, const std::vector< std::string > &storage_level_names, const tiling↵::NestOfCompoundMasks &mask_nest, const std::vector< [problem::PerDataSpace](#)< std::uint64_t >> &utilized_capacities, const std::vector< [problem::PerDataSpace](#)< std::uint64_t >> &tile_sizes, const std↵::string _indent="")
- void **PrintWhoopNest** (std::ostream &out, const std::vector< std::string > &storage_level_names, const tiling↵::NestOfCompoundMasks &mask_nest, const std::vector< [problem::PerDataSpace](#)< std::uint64_t >> &tile_sizes, const std::vector< [problem::PerDataSpace](#)< std::uint64_t >> &utilized_instances)
- std::string **PrintCompact** (const tiling::NestOfCompoundMasks &mask_nest)
- void **PrintTenssella** (std::ostream &out, const tiling::NestOfCompoundMasks &mask_nest)

Public Attributes

- std::vector< [Descriptor](#) > **loops**
Loops in order or inner to outer.
- std::vector< uint64_t > **storage_tiling_boundaries**
Indices of loops just below storage levels.
- std::unordered_map< unsigned, [SkewDescriptor](#) > **skew_descriptors**
- std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > **no_link_transfer**
A mapping from loop index to link transfer flags per data space.
- std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > **no_multicast**
- std::unordered_map< unsigned, [problem::PerDataSpace](#)< bool > > **no_temporal_reuse**

Friends

- `std::ostream & operator<< (std::ostream &out, const Nest &nest)`

4.70.1 Detailed Description

A nest of loops.

Loops are organized in order of inner to outer.

Also holds storage boundaries (i.e., indices of loops just under storage levels), skew descriptors, link transfer, multicast, and temporal reuse flags.

The documentation for this class was generated from the following files:

- `include/mapping/nest.hpp`
- `src/mapping/nest.cpp`

4.71 analysis::NestAnalysis Class Reference

Public Member Functions

- `void Init (problem::Workload *wc, const loop::Nest *nest, std::map< unsigned, std::uint64_t > fanoutX_map, std::map< unsigned, std::uint64_t > fanoutY_map)`
- `void Reset ()`
- `std::vector< problem::PerDataSpace< std::size_t > > GetWorkingSetSizes_LTW () const`
- `CompoundDataMovementNest GetWorkingSets ()`
- `CompoundComputeNest GetComputeInfo ()`
- `problem::Workload * GetWorkload ()`
- `template<class Archive >`
`void serialize (Archive &ar, const unsigned int version=0)`

Friends

- `class boost::serialization::access`
- `std::ostream & operator<< (std::ostream &out, const NestAnalysis &n)`

The documentation for this class was generated from the following files:

- `include/loop-analysis/nest-analysis.hpp`
- `src/loop-analysis/nest-analysis.cpp`

4.72 model::Network Class Reference

Inheritance diagram for `model::Network`:

Collaboration diagram for `model::Network`:

Public Member Functions

- virtual std::shared_ptr< [Network](#) > **Clone** () const =0
- virtual void **ConnectSource** (std::weak_ptr< [Level](#) > source)=0
- virtual void **ConnectSink** (std::weak_ptr< [Level](#) > sink)=0
- virtual void **SetName** (std::string name)=0
- virtual void **AddConnectionType** (ConnectionType ct)=0
- virtual void **ResetConnectionType** ()=0
- virtual double **Energy** (problem::Shape::DataSpaceID pv=problem::GetShape() ->NumDataSpaces) const =0
- virtual std::string **Name** () const =0
- virtual bool **DistributedMulticastSupported** () const =0
- virtual void **SetTileWidth** (double width_um)=0
- virtual [EvalStatus](#) **Evaluate** (const [tiling::CompoundTile](#) &tile, const bool break_on_failure)=0
- virtual void **Print** (std::ostream &out) const =0
- virtual std::uint64_t **WordBits** () const =0
- virtual std::uint64_t **FillLatency** () const =0
- virtual std::uint64_t **DrainLatency** () const =0
- virtual void **SetFillLatency** (std::uint64_t)=0
- virtual void **SetDrainLatency** (std::uint64_t)=0
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Friends

- class **boost::serialization::access**
- std::ostream & **operator<<** (std::ostream &out, const [Network](#) &network)

Additional Inherited Members

The documentation for this class was generated from the following file:

- include/model/network.hpp

4.73 model::NetworkFactory Class Reference

Static Public Member Functions

- static std::shared_ptr< [NetworkSpecs](#) > **ParseSpecs** ([config::CompoundConfigNode](#) network, uint32_t n↔_elements, bool is_sparse_module)
- static std::shared_ptr< [Network](#) > **Construct** (std::shared_ptr< [NetworkSpecs](#) > specs)

The documentation for this class was generated from the following files:

- include/model/network-factory.hpp
- src/model/network-factory.cpp

4.74 model::NetworkSpecs Struct Reference

Inheritance diagram for model::NetworkSpecs:

Public Member Functions

- virtual std::shared_ptr< [NetworkSpecs](#) > **Clone** () const =0
- virtual const std::string **Type** () const =0
- virtual bool **SupportAccelergyTables** () const =0
- virtual void **ProcessERT** (const [config::CompoundConfigNode](#) &ERT)=0
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- std::string **name** = "UNSET"
- ConnectionType **cType** = Unused

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/model/network.hpp

4.75 problem::OperationPoint Class Reference

Inheritance diagram for problem::OperationPoint:

Collaboration diagram for problem::OperationPoint:

Additional Inherited Members

The documentation for this class was generated from the following file:

- include/workload/shape-models/operation-space.hpp

4.76 problem::OperationSpace Class Reference

Public Member Functions

- **OperationSpace** (const [Workload](#) *wc)
- **OperationSpace** (const [Workload](#) *wc, const [OperationPoint](#) &flattened_low, const [OperationPoint](#) &flattened_high)
- void **Reset** ()
- [OperationSpace](#) & **operator+=** (const [OperationPoint](#) &p)
- [OperationSpace](#) **operator-** (const [OperationSpace](#) &p)
- void **SaveAndSubtract** ([OperationSpace](#) &prev, [problem::PerDataSpace](#)< bool > no_temporal_reuse)
- void **SaveAndSubtractIfSameStride** ([OperationSpace](#) &prev, [problem::PerDataSpace](#)< [Point](#) > &prev_↔ translation, [problem::PerDataSpace](#)< bool > no_temporal_reuse)
- [DataSpace](#) & **GetDataSpace** ([Shape::DataSpaceID](#) pv)
- [PerDataSpace](#)< std::size_t > **GetSizes** () const
- std::size_t **GetSize** (const int t) const
- bool **IsEmpty** (const int t) const
- bool **CheckEquality** (const [OperationSpace](#) &rhs, const int t) const
- void **PrintSizes** ()
- void **Print** (std::ostream &out=std::cerr) const
- void **Print** ([Shape::DataSpaceID](#) pv, std::ostream &out=std::cerr) const

The documentation for this class was generated from the following files:

- include/workload/shape-models/operation-space.hpp
- src/workload/shape-models/operation-space.cpp

4.77 PatternGenerator128 Class Reference

Inheritance diagram for PatternGenerator128:

Public Member Functions

- **PatternGenerator128** (uint128_t bound)
- virtual uint128_t **Next** ()=0

Protected Attributes

- const std::uint64_t **uint64_max_** = std::numeric_limits<std::uint64_t>::max()
- uint128_t **bound_**

The documentation for this class was generated from the following files:

- include/util/numeric.hpp
- src/util/numeric.cpp

4.78 `problem::PerDataSpace< T >` Class Template Reference

Inheritance diagram for `problem::PerDataSpace< T >`:

Collaboration diagram for `problem::PerDataSpace< T >`:

Public Member Functions

- **PerDataSpace** (`std::initializer_list< T > l`)
- `T & operator[]` (`unsigned pv`)
- `const T & operator[]` (`unsigned pv`) `const`
- `T & at` (`unsigned pv`)
- `const T & at` (`unsigned pv`) `const`
- `void clear` ()
- `T Max` () `const`
- `template<class Archive >`
`void serialize` (`Archive &ar`, `const unsigned int version=0`)

Friends

- `class boost::serialization::access`
- `std::ostream & operator<<` (`std::ostream &out`, `const PerDataSpace< T > &x`)

The documentation for this class was generated from the following file:

- `include/workload/util/per-data-space.hpp`

4.79 `sparse::PerDataSpaceCompressionInfo` Struct Reference

Public Member Functions

- `bool HasMetaData` () `const`
- `bool ExistFlatteningRule` (`std::uint64_t rank_id`) `const`
- `bool FoundDimensionInFlatteningRule` (`std::uint64_t rank_id`, `problem::Shape::FlattenedDimensionID dim_id`, `std::vector< problem::Shape::FlattenedDimensionID > &rule_item`) `const`
- `problem::Shape::FlattenedDimensionID GetFlatteningRule` (`std::uint64_t rank_id`, `std::uint64_t rule_idx=0`) `const`

Public Attributes

- `bool tensor_compressed` = `false`
- `bool apply_rank_inner_to_outer` = `false`
- `std::vector< bool > rank_compressed`
- `std::vector< bool > coordinates_implicit`
- `std::vector< std::string > rank_formats`
- `std::vector< std::vector< std::vector< problem::Shape::FlattenedDimensionID > > > flattened_rankIDs`
- `std::vector< std::shared_ptr< problem::MetaDataFormat > > metadata_models`
- `double compression_rate`

The documentation for this struct was generated from the following files:

- `include/model/sparse-optimization-info.hpp`
- `src/model/sparse-optimization-info.cpp`

4.80 problem::PerFlattenedDimension< T > Class Template Reference

Inheritance diagram for problem::PerFlattenedDimension< T >:

Collaboration diagram for problem::PerFlattenedDimension< T >:

Public Member Functions

- **PerFlattenedDimension** (std::initializer_list< T > l)
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Friends

- class **boost::serialization::access**
- std::ostream & **operator**<< (std::ostream &out, const [PerFlattenedDimension](#)< T > &x)

The documentation for this class was generated from the following file:

- include/workload/util/per-problem-dimension.hpp

4.81 mapspace::PermutationSpace Class Reference

Inheritance diagram for mapspace::PermutationSpace:

Collaboration diagram for mapspace::PermutationSpace:

Public Member Functions

- void **Init** (uint64_t num_levels)
- virtual void **InitLevelCanonical** (uint64_t level)
- virtual void **InitLevel** (uint64_t level, std::vector< problem::Shape::FlattenedDimensionID > user_↵ prefix, std::vector< problem::Shape::FlattenedDimensionID > user_suffix, std::vector< problem::Shape::↵ FlattenedDimensionID > pruned_dimensions={})
- virtual std::vector< std::vector< problem::Shape::FlattenedDimensionID > > **GetPatterns** (uint128_t id)
- uint128_t **Size** () const

Protected Attributes

- std::uint64_t **num_levels_**
- std::map< unsigned, Pattern > **patterns_**
- std::map< unsigned, std::uint64_t > **size_**
- [Factoradic](#)< problem::Shape::FlattenedDimensionID > **factoradic_**

The documentation for this class was generated from the following files:

- include/mapspaces/subspaces.hpp
- src/mapspaces/subspaces.cpp

4.82 problem::PerRankMetaDataTileOccupancy Struct Reference

Public Member Functions

- void **SetEmpty** ()
- void **SetPayloadUnits** (const std::uint64_t units)
- double **MetaDataUnits** () const
- double **PayloadUnits** () const
- std::uint32_t **MetaDataWordBits** () const
- std::uint32_t **PayloadWordBits** () const
- double **TotalMetDataAndPayloadUnits** () const
- void **Scale** (double s)
- void **Add** ([PerRankMetaDataTileOccupancy](#) m)
- bool **IsEmpty** ()
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- double **metadata_units**
- double **payload_units**
- std::uint32_t **metadata_word_bits**
- std::uint32_t **payload_word_bits**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- include/workload/format-models/metadata-format.hpp
- src/workload/format-models/metadata-format.cpp

4.83 Point Class Reference

Inheritance diagram for Point:

Public Member Functions

- **Point** (const [Point](#) &p)
- **Point** (std::uint32_t order)
- **Point** (std::vector< Coordinate > coordinates)
- [Point](#) & **operator=** ([Point](#) other)
- bool **operator==** (const [Point](#) &other)
- [Point](#) **DiscardTopRank** () const
- void **AddTopRank** (Coordinate x)
- void **Reset** ()
- std::uint32_t **Order** () const
- std::vector< Coordinate > **GetCoordinates** () const
- Coordinate & **operator[]** (std::uint32_t i)
- const Coordinate & **operator[]** (std::uint32_t i) const
- void **IncrementAllDimensions** (Coordinate m=1)
- [Point](#) **operator+** ([Point](#) &other)
- void **Scale** (unsigned factor)
- std::ostream & **Print** (std::ostream &out=std::cout) const

Protected Attributes

- `std::uint32_t` **order_**
- `std::vector< Coordinate >` **coordinates_**

Friends

- `void` **swap** ([Point](#) &first, [Point](#) &second)
- `std::ostream &` **operator<<** (`std::ostream &`out, const [Point](#) &p)

The documentation for this class was generated from the following files:

- `include/loop-analysis/point.hpp`
- `src/loop-analysis/point.cpp`

4.84 PointResult Struct Reference

Collaboration diagram for PointResult:

Public Member Functions

- **PointResult** (`std::string` name, [EvaluationResult](#) result)
- `void` **PrintEvaluationResultsHeader** (`std::ostream &`out)
- `void` **PrintEvaluationResult** (`std::ostream &`out)

Public Attributes

- `std::string` **config_name_**
- [EvaluationResult](#) **result_**

The documentation for this struct was generated from the following files:

- `include/applications/design-space/design-space.hpp`
- `src/applications/design-space/design-space.cpp`

4.85 ProblemSpace Class Reference

Public Member Functions

- **ProblemSpace** (`std::string` n)
- `void` **InitializeFromFile** (`std::string` filename)
- `void` **InitializeFromFileList** (`YAML::Node` list_yaml)
- `int` **GetSize** ()
- [ProblemSpaceNode](#) & **GetNode** (`int` index)

Protected Attributes

- `std::string name_`
- `std::vector< ProblemSpaceNode > problems_`

The documentation for this class was generated from the following files:

- `include/applications/design-space/problem.hpp`
- `src/applications/design-space/problem.cpp`

4.86 ProblemSpaceNode Class Reference

Public Member Functions

- **ProblemSpaceNode** (`std::string n`, `YAML::Node p`)

Public Attributes

- `std::string name_`
- `YAML::Node yaml_`

The documentation for this class was generated from the following files:

- `include/applications/design-space/problem.hpp`
- `src/applications/design-space/problem.cpp`

4.87 RandomGenerator128 Class Reference

Inheritance diagram for RandomGenerator128:

Collaboration diagram for RandomGenerator128:

Public Member Functions

- **RandomGenerator128** (`uint128_t bound`)
- `uint128_t Next ()`

Additional Inherited Members

The documentation for this class was generated from the following files:

- `include/util/numeric.hpp`
- `src/util/numeric.cpp`

4.88 search::RandomPrunedSearch Class Reference

Inheritance diagram for search::RandomPrunedSearch:

Collaboration diagram for search::RandomPrunedSearch:

Public Member Functions

- **RandomPrunedSearch** ([config::CompoundConfigNode](#) config, [mapspace::MapSpace](#) *mapspace, unsigned id)
- bool **IncrementRecursive**_ (int position=0)
- bool **Next** ([mapspace::ID](#) &mapping_id)
- void **Report** (Status status, double cost=0)

The documentation for this class was generated from the following files:

- include/search/random-pruned.hpp
- src/search/random-pruned.cpp

4.89 search::RandomSearch Class Reference

Inheritance diagram for search::RandomSearch:

Collaboration diagram for search::RandomSearch:

Public Member Functions

- **RandomSearch** ([config::CompoundConfigNode](#) config, [mapspace::MapSpace](#) *mapspace)
- **RandomSearch** (const [RandomSearch](#) &)=delete
- [RandomSearch](#) & **operator=** (const [RandomSearch](#) &)=delete
- bool **Next** ([mapspace::ID](#) &mapping_id)
- void **Report** (Status status, double cost=0)

The documentation for this class was generated from the following files:

- include/search/random.hpp
- src/search/random.cpp

4.90 model::ReductionTreeNetwork Class Reference

Inheritance diagram for model::ReductionTreeNetwork:

Collaboration diagram for model::ReductionTreeNetwork:

Classes

- struct [Specs](#)
- struct [Stats](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **ReductionTreeNetwork** (const [Specs](#) &specs)
- [Specs](#) & **GetSpecs** ()
- std::shared_ptr< [Network](#) > **Clone** () const override
- void **ConnectSource** (std::weak_ptr< [Level](#) > source) override
- void **ConnectSink** (std::weak_ptr< [Level](#) > sink) override
- void **SetName** (std::string name) override
- std::string **Name** () const override
- void **AddConnectionType** (ConnectionType ct) override
- void **ResetConnectionType** () override
- bool **DistributedMulticastSupported** () const override
- void **SetTileWidth** (double width_um) override
- [EvalStatus](#) **Evaluate** (const [tiling::CompoundTile](#) &tile, const bool break_on_failure) override
- void **Print** (std::ostream &out) const override
- std::uint64_t **WordBits** () const override
- std::uint64_t **FillLatency** () const override
- std::uint64_t **DrainLatency** () const override
- void **SetFillLatency** (std::uint64_t fill_latency) override
- void **SetDrainLatency** (std::uint64_t drain_latency) override
- **STAT_ACCESSOR_HEADER** (double, Energy) override

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) network, std::size_t n_elements, bool is_sparse↔_module)
- static double **WireEnergyPerHop** (std::uint64_t word_bits, const double hop_distance, double wire_↔energy_override)
- static double **AdderEnergy** (std::uint64_t word_bits, double adder_energy_override)

Public Attributes

- [Stats](#) stats_

Friends

- class **boost::serialization::access**

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/model/network-reduction-tree.hpp
- src/model/network-reduction-tree.cpp

4.91 ResidualFactors Class Reference

Public Member Functions

- **ResidualFactors** (const unsigned long n, const int order, std::vector< unsigned long > remainder_bounds, std::vector< unsigned long > remainder_ix)
- **ResidualFactors** (const unsigned long n, const int order, std::vector< unsigned long > remainder_bounds, std::vector< unsigned long > remainder_ix, std::map< unsigned, unsigned long > given)
- void **PruneMax** ()
- std::vector< std::vector< unsigned long > > **operator[]** (int index)
- std::size_t **size** ()
- void **Print** ()
- void **PrintAllFactors** ()
- void **PrintCoFactors** ()

Friends

- std::ostream & **operator<<** (std::ostream &out, const [ResidualFactors](#) &f)

The documentation for this class was generated from the following files:

- include/util/numeric.hpp
- src/util/numeric.cpp

4.92 mapspace::ResidualIndexFactorizationSpace Class Reference

Public Member Functions

- void **Init** (const [problem::Workload](#) &workload, std::map< problem::Shape::FlattenedDimensionID, std::uint64_t > cofactors_order, std::map< problem::Shape::FlattenedDimensionID, std::map< unsigned, unsigned long >> prefactors, std::map< problem::Shape::FlattenedDimensionID, std::map< unsigned, unsigned long >> maxfactors, std::vector< unsigned long int > remainders={}, std::vector< unsigned long int > remainders_ix={})
- std::vector< unsigned long > **GetFactor** (uint128_t nest_id, problem::Shape::FlattenedDimensionID dim, unsigned level)
- uint128_t **Size** () const

The documentation for this class was generated from the following files:

- include/mapspaces/subspaces.hpp
- src/mapspaces/subspaces.cpp

4.93 mapspace::Ruby Class Reference

Inheritance diagram for mapspace::Ruby:

Collaboration diagram for mapspace::Ruby:

Public Member Functions

- **Ruby** ([config::CompoundConfigNode](#) config, [config::CompoundConfigNode](#) arch_constraints, [model::Engine::Specs](#) arch_specs, const [problem::Workload](#) &workload, bool filter_spatial_fanout=true, bool skip_init=false)
- **Ruby** (const [Ruby](#) &other)=default
- void **Init** ([config::CompoundConfigNode](#) config, [config::CompoundConfigNode](#) arch_constraints)
- void **InitIndexFactorizationSpace** ()
- void **InitLoopPermutationSpace** (std::map< unsigned, std::vector< [problem::Shape::Flattened](#)↵ DimensionID >> pruned_dimensions={})
- void **InitSpatialSpace** (std::map< unsigned, unsigned > unit_factors={})
- void **InitDatatypeBypassNestSpace** ()
- void **InitPruned** (uint128_t index_factorization_id)
- std::vector< [MapSpace](#) * > **Split** (std::uint64_t num_splits)
- void **InitSplit** (std::uint64_t split_id, uint128_t split_if_size, std::uint64_t num_parent_splits)
- bool **IsSplit** ()
- std::vector< [Status](#) > **ConstructMapping** ([mapspace::ID](#) mapping_id, [Mapping](#) *mapping, bool break_↵ on_failure=true)
- void **InitSubnests** (loop::NestConfig &subnests)
- void **PermuteSubnests** (uint128_t mapping_permutation_id, loop::NestConfig &subnests)
- void **AssignIndexFactors** (uint128_t mapping_index_factorization_id, loop::NestConfig &subnests)
- std::vector< [Status](#) > **AssignSpatialTilingDirections** (uint128_t mapping_spatial_id, loop::NestConfig &subnests, [tiling::CompoundMaskNest](#) datatype_bypass_nest, bool break_on_failure)
- [Status](#) **AssignSpatialTilingDirections_Level_Expand** (std::uint32_t spatial_split, std::vector< [loop::Descriptor](#) > &level_nest, unsigned tiling_level_id, double &fanout_utilization)
- [tiling::CompoundMaskNest](#) **ConstructDatatypeBypassNest** (uint128_t mapping_datatype_bypass_id)
- void **Parse** ([config::CompoundConfigNode](#) config, [config::CompoundConfigNode](#) arch_constraints)

Protected Attributes

- [RubyPermutationSpace](#) permutation_space_
- [ResidualIndexFactorizationSpace](#) index_factorization_space_
- [SpatialSplitSpace](#) spatial_split_space_
- std::vector< [tiling::CompoundMaskNest](#) > datatype_bypass_nest_space_
- std::vector< [Ruby](#) * > splits_
- std::uint64_t split_id_
- std::uint64_t num_parent_splits_
- [ArchProperties](#) arch_props_
- [mapping::Constraints](#) constraints_
- bool filter_spatial_fanout_

The documentation for this class was generated from the following files:

- include/mapspaces/ruby.hpp
- src/mapspaces/ruby.cpp

4.94 mapspace::RubyPermutationSpace Class Reference

Inheritance diagram for mapspace::RubyPermutationSpace:

Collaboration diagram for mapspace::RubyPermutationSpace:

Public Member Functions

- void **InitLevel** (uint64_t level, std::vector< problem::Shape::FlattenedDimensionID > user_prefix, std::vector< problem::Shape::FlattenedDimensionID > user_suffix, std::vector< problem::Shape::FlattenedDimensionID > pruned_dimensions={})
- std::vector< std::vector< problem::Shape::FlattenedDimensionID > > **GetPatterns** (uint128_t id)

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/mapspaces/subspaces.hpp
- src/mapspaces/subspaces.cpp

4.95 problem::RunLengthEncoding Class Reference

Inheritance diagram for problem::RunLengthEncoding:

Collaboration diagram for problem::RunLengthEncoding:

Classes

- struct [Specs](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **RunLengthEncoding** (const [Specs](#) &specs)
- [PerRankMetaDataTileOccupancy](#) **GetOccupancy** (const [MetaDataOccupancyQuery](#) &query) const
- bool **RankCompressed** () const
- bool **CoordinatesImplicit** () const
- std::vector< problem::Shape::FlattenedDimensionID > **GetDimensionIDs** () const
- std::string **GetFormatName** () const
- bool **MetaDataImplicitAsLowestRank** () const
- const [MetaDataFormatSpecs](#) & **GetSpecs** () const

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) metadata_config)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/format-models/run-length-encoding.hpp
- src/workload/format-models/run-length-encoding.cpp

4.96 search::SearchAlgorithm Class Reference

Inheritance diagram for search::SearchAlgorithm:

Public Member Functions

- virtual bool **Next** (mapspace::ID &mapping_id)=0
- virtual void **Report** (Status status, double cost=0)=0

The documentation for this class was generated from the following file:

- include/search/search.hpp

4.97 SequenceGenerator128 Class Reference

Inheritance diagram for SequenceGenerator128:

Collaboration diagram for SequenceGenerator128:

Public Member Functions

- **SequenceGenerator128** (uint128_t bound, bool autoloop=true)
- uint128_t **Next** ()

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/util/numeric.hpp
- src/util/numeric.cpp

4.98 sparse::SetOfOperationSpaces Struct Reference

Collaboration diagram for sparse::SetOfOperationSpaces:

Public Attributes

- std::vector< loop::Descriptor > **upper_level_loops**
- problem::OperationPoint **op_space_mold_high**
- problem::Workload * **workload**

The documentation for this struct was generated from the following file:

- include/sparse-analysis/state.hpp

4.99 problem::Shape Class Reference

Public Types

- typedef unsigned **FactorizedDimensionID**
- typedef unsigned **FlattenedDimensionID**
- typedef int **Coefficient**
- typedef unsigned **CoefficientID**
- typedef std::map< CoefficientID, int > **Coefficients**
- typedef unsigned **DataSpaceID**
- typedef std::pair< CoefficientID, FactorizedDimensionID > **ProjectionTerm**
- typedef std::list< ProjectionTerm > **ProjectionExpression**
- typedef std::vector< ProjectionExpression > **Projection**

Public Member Functions

- void **Parse** ([config::CompoundConfigNode](#) config)
- std::set< FlattenedDimensionID > **GetColteratedDimensions** (const std::vector< DataSpaceID > dataspace_pair) const
- std::set< FlattenedDimensionID > **GetFullyContractedDimensions** () const

Public Attributes

- unsigned **NumFactorizedDimensions** = 0
- std::map< FactorizedDimensionID, std::string > **FactorizedDimensionIDToName**
- std::map< std::string, FactorizedDimensionID > **FactorizedDimensionNameToID**
- bool **UsesFlattening**
- unsigned **NumFlattenedDimensions** = 0
- std::map< FlattenedDimensionID, std::string > **FlattenedDimensionIDToName**
- std::map< std::string, FlattenedDimensionID > **FlattenedDimensionNameToID**
- std::vector< std::vector< FactorizedDimensionID > > **FlattenedToFactorized**
- std::map< FactorizedDimensionID, FlattenedDimensionID > **FactorizedToFlattened**
- unsigned **NumCoefficients** = 0
- std::map< std::string, CoefficientID > **CoefficientNameToID**
- std::map< CoefficientID, std::string > **CoefficientIDToName**
- std::map< CoefficientID, int > **DefaultCoefficients**
- unsigned **NumDataSpaces** = 0
- std::map< std::string, DataSpaceID > **DataSpaceNameToID**
- std::map< DataSpaceID, std::string > **DataSpaceIDToName**
- std::map< DataSpaceID, unsigned > **DataSpaceOrder**
- std::map< DataSpaceID, bool > **IsReadWriteDataSpace**
- std::vector< Projection > **Projections**
- std::vector< std::set< FlattenedDimensionID > > **DataSpaceIDToDimensionIDVector**

The documentation for this class was generated from the following files:

- include/workload/shape-models/problem-shape.hpp
- src/workload/shape-models/problem-shape.cpp

4.100 model::SimpleMulticastNetwork Class Reference

Inheritance diagram for model::SimpleMulticastNetwork:

Collaboration diagram for model::SimpleMulticastNetwork:

Classes

- struct [Specs](#)
- struct [Stats](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **SimpleMulticastNetwork** (const [Specs](#) &specs)
- [Specs](#) & **GetSpecs** ()
- std::shared_ptr< [Network](#) > **Clone** () const override
- void **ConnectSource** (std::weak_ptr< [Level](#) > source) override
- void **ConnectSink** (std::weak_ptr< [Level](#) > sink) override
- void **SetName** (std::string name) override
- std::string **Name** () const override
- void **AddConnectionType** (ConnectionType ct) override
- void **ResetConnectionType** () override
- bool **DistributedMulticastSupported** () const override
- void **SetTileWidth** (double width_um) override
- double **GetOpEnergyFromERT** (std::uint64_t multicast_factor, std::string operation_name)
- double **GetMulticastEnergy** (std::uint64_t multicast_factor)
- double **GetMulticastEnergyByDataType** (std::uint64_t multicast_factor, std::string data_space_name)
- [EvalStatus](#) **Evaluate** (const [tiling::CompoundTile](#) &tile, const bool break_on_failure) override
- void **Print** (std::ostream &out) const override
- std::uint64_t **WordBits** () const override
- std::uint64_t **FillLatency** () const override
- std::uint64_t **DrainLatency** () const override
- void **SetFillLatency** (std::uint64_t fill_latency) override
- void **SetDrainLatency** (std::uint64_t drain_latency) override
- **STAT_ACCESSOR_HEADER** (double, Energy) override

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) network, std::size_t n_elements, bool is_sparse↔_module)

Public Attributes

- [Stats](#) stats_

Friends

- class **boost::serialization::access**

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/model/network-simple-multicast.hpp
- src/model/network-simple-multicast.cpp

4.101 loop::Nest::SkewDescriptor Struct Reference

Classes

- struct [Term](#)

Public Attributes

- std::vector< [Term](#) > **terms**
- int **modulo**

The documentation for this struct was generated from the following file:

- include/mapping/nest.hpp

4.102 sparse::SparseAnalysisState Struct Reference

Collaboration diagram for sparse::SparseAnalysisState:

Public Member Functions

- bool **Init** ([sparse::SparseOptimizationInfo](#) *sparse_optimization_info, [problem::Workload](#) *workload, [Mapping](#) mapping, std::uint64_t num_storage_levels)
- void **Reset** ()
- void **CollectCompletePointSetsAndSubnests** ()
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- [sparse::SparseOptimizationInfo](#) * **sparse_optimization_info_** = nullptr
- [problem::Workload](#) * **workload_** = nullptr
- std::uint64_t **num_storage_levels_**
- [Mapping](#) **mapping_**
- std::vector< std::vector< [problem::OperationPoint](#) > > **maxtile_molds_high_**
- std::vector< std::vector< [loop::Descriptor](#) > > **complete_subnests_**
- std::vector< std::vector< bool > > **trivial_nest_masks_**
- std::map< unsigned, std::map< DataSpaceID, double > > **prob_explicitly_optimized_read_**
- std::map< unsigned, std::map< DataSpaceID, double > > **prob_explicitly_spatially_optimized_read_**
- std::map< std::string, ListOfPerDataSpaceMask > **dspace_optimization_masks_**
- std::map< std::string, ListOfPerDataSpaceMask > **scalar_scalar_opt_masks_**
- std::map< unsigned, std::map< DataSpaceID, [problem::OperationPoint](#) > > **cond_on_mold_highs_**
- [problem::PerDataSpace](#)< std::vector< [SpatialExpansion](#) > > **max_spatial_expansion_**
- [problem::PerDataSpace](#)< std::vector< double > > **avg_effective_expansion_ratio_**
- std::vector< [problem::Shape::FactorizedDimensionID](#) > **c_intersection_dims_**
- std::map< DataSpaceID, double > **c_operand_densities_**
- std::map< DataSpaceID, bool > **storage_gs_saf_**
- std::map< DataSpaceID, double > **innermost_empty_cond_on_prob_**

Friends

- class **boost::serialization::access**
- `std::ostream & operator<< (std::ostream &out, const SparseAnalysisState &n)`

The documentation for this struct was generated from the following files:

- `include/sparse-analysis/state.hpp`
- `src/sparse-analysis/state.cpp`

4.103 `sparse::SparseOptimizationInfo` Struct Reference

Collaboration diagram for `sparse::SparseOptimizationInfo`:

Public Attributes

- `StorageActionOptimizationInfo` **action_gating_info**
- `StorageActionOptimizationInfo` **action_skipping_info**
- `StorageActionOptimizationInfo` **action_spatial_skipping_info**
- `ComputeOptimizationInfo` **compute_optimization_info**
- [CompressionInfo](#) **compression_info**
- `bool` **no_optimization_applied**
- `std::map< unsigned, std::uint64_t >` **max_fanoutX**
- `std::map< unsigned, std::uint64_t >` **max_fanoutY**

The documentation for this struct was generated from the following file:

- `include/model/sparse-optimization-info.hpp`

4.104 `sparse::SpatialExpansion` Struct Reference

Public Attributes

- `std::uint64_t` **X** = 1
- `std::uint64_t` **Y** = 1
- `std::uint64_t` **XY** = 1

The documentation for this struct was generated from the following file:

- `include/sparse-analysis/state.hpp`

4.105 mapspace::SpatialSplitSpace Class Reference

Public Member Functions

- void **Init** (uint64_t num_levels)
- void **InitLevel** (uint64_t level, unsigned unit_factors=0)
- void **InitLevelUserSpecified** (uint64_t level, std::uint32_t user_split)
- std::map< unsigned, std::uint32_t > **GetSplits** (uint128_t id)
- uint128_t **Size** () const

The documentation for this class was generated from the following files:

- include/mapspaces/subspaces.hpp
- src/mapspaces/subspaces.cpp

4.106 model::Topology::Specs Class Reference

Public Member Functions

- **Specs** (const Specs &other)
- Specs & **operator=** (Specs other)
- unsigned **NumLevels** () const
- unsigned **NumStorageLevels** () const
- unsigned **NumNetworks** () const
- std::vector< std::string > **LevelNames** () const
- std::vector< std::string > **StorageLevelNames** () const
- void **ParseAccelergyERT** (config::CompoundConfigNode ert)
- void **ParseAccelergyART** (config::CompoundConfigNode art)
- void **AddLevel** (unsigned typed_id, std::shared_ptr< LevelSpecs > level_specs)
- void **AddInferredNetwork** (std::shared_ptr< LegacyNetwork::Specs > specs)
- void **AddNetwork** (std::shared_ptr< NetworkSpecs > specs)
- unsigned **StorageMap** (unsigned i) const
- unsigned **ArithmeticMap** () const
- std::shared_ptr< LevelSpecs > **GetLevel** (unsigned level_id) const
- std::shared_ptr< BufferLevel::Specs > **GetStorageLevel** (unsigned storage_level_id) const
- std::shared_ptr< ArithmeticUnits::Specs > **GetArithmeticLevel** () const
- std::shared_ptr< LegacyNetwork::Specs > **GetInferredNetwork** (unsigned network_id) const
- std::shared_ptr< NetworkSpecs > **GetNetwork** (unsigned network_id) const

Friends

- void **swap** (Specs &first, Specs &second)

The documentation for this class was generated from the following files:

- include/model/topology.hpp
- src/model/topology.cpp

4.107 problem::CoordinatePayload::Specs Struct Reference

Inheritance diagram for problem::CoordinatePayload::Specs:

Collaboration diagram for problem::CoordinatePayload::Specs:

Public Member Functions

- const std::string **Name** () const override
- bool **RankCompressed** () const override
- std::vector< problem::Shape::FlattenedDimensionID > **DimensionIDs** () const override
- std::uint32_t **MetaDataWordBits** () const override
- std::uint32_t **PayloadWordBits** () const override
- void **SetMetaDataWordBits** (std::uint32_t word_bits) override
- void **SetPayloadWordBits** (std::uint32_t word_bits) override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [MetaDataFormatSpecs](#) > **Clone** () const override

Public Attributes

- std::string **name** = "cp"
- bool **rank_compressed** = true
- bool **coordinates_implicit** = false
- std::vector< problem::Shape::FlattenedDimensionID > **dimension_ids**
- std::uint32_t **metadata_word_bits**
- std::uint32_t **payload_word_bits**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/workload/format-models/coordinate-payload.hpp

4.108 problem::UncompressedBitmask::Specs Struct Reference

Inheritance diagram for problem::UncompressedBitmask::Specs:

Collaboration diagram for problem::UncompressedBitmask::Specs:

Public Member Functions

- const std::string **Name** () const override
- bool **RankCompressed** () const override
- std::vector< problem::Shape::FlattenedDimensionID > **DimensionIDs** () const override
- std::uint32_t **MetaDataWordBits** () const override
- std::uint32_t **PayloadWordBits** () const override
- void **SetMetaDataWordBits** (std::uint32_t word_bits) override
- void **SetPayloadWordBits** (std::uint32_t word_bits) override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [MetaDataFormatSpecs](#) > **Clone** () const override

Public Attributes

- std::string **name** = "ub"
- bool **rank_compressed** = false
- bool **coordinates_implicit** = true
- std::vector< problem::Shape::FlattenedDimensionID > **dimension_ids**
- std::uint32_t **metadata_word_bits**
- std::uint32_t **payload_word_bits**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/workload/format-models/uncompressed-bitmask.hpp

4.109 model::SimpleMulticastNetwork::Specs Struct Reference

Inheritance diagram for model::SimpleMulticastNetwork::Specs:

Collaboration diagram for model::SimpleMulticastNetwork::Specs:

Public Member Functions

- const std::string **Type** () const override
- bool **SupportAccelerergyTables** () const override
- void **ProcessERT** (const [config::CompoundConfigNode](#) &ERT) override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [NetworkSpecs](#) > **Clone** () const override

Public Attributes

- `std::string` **type**
- `Attribute< std::uint64_t >` **word_bits**
- `Attribute< std::uint64_t >` **fill_latency**
- `Attribute< std::uint64_t >` **drain_latency**
- `Attribute< double >` **tile_width**
- `Attribute< bool >` **is_sparse_module**
- `config::CompoundConfigNode` **accelergyERT**
- `std::string` **action_name**
- `std::string` **multicast_factor_argument**
- `bool` **per_datatype_ERT**

Static Public Attributes

- `static const std::uint64_t` **kDefaultWordBits** = 16

Friends

- class `boost::serialization::access`

The documentation for this struct was generated from the following files:

- `include/model/network-simple-multicast.hpp`
- `src/model/network-simple-multicast.cpp`

4.110 `model::ReductionTreeNetwork::Specs` Struct Reference

Inheritance diagram for `model::ReductionTreeNetwork::Specs`:

Collaboration diagram for `model::ReductionTreeNetwork::Specs`:

Public Member Functions

- `const std::string` **Type** () const override
- `bool` **SupportAccelergyTables** () const override
- `void` **ProcessERT** (const `config::CompoundConfigNode` &ERT) override
- `template<class Archive >`
void **serialize** (Archive &ar, const unsigned int version=0)
- `std::shared_ptr< NetworkSpecs >` **Clone** () const override

Public Attributes

- `std::string` **type**
- `Attribute< std::uint64_t >` **word_bits**
- `Attribute< double >` **adder_energy**
- `Attribute< double >` **wire_energy**
- `Attribute< std::uint64_t >` **fill_latency**
- `Attribute< std::uint64_t >` **drain_latency**
- `Attribute< double >` **tile_width**
- `Attribute< bool >` **is_sparse_module**

Static Public Attributes

- static const std::uint64_t **kDefaultWordBits** = 16

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- include/model/network-reduction-tree.hpp
- src/model/network-reduction-tree.cpp

4.111 model::Engine::Specs Struct Reference

Collaboration diagram for model::Engine::Specs:

Public Attributes

- [Topology::Specs](#) **topology**

The documentation for this struct was generated from the following file:

- include/model/engine.hpp

4.112 problem::FixedStructuredDistribution::Specs Struct Reference

Inheritance diagram for problem::FixedStructuredDistribution::Specs:

Collaboration diagram for problem::FixedStructuredDistribution::Specs:

Public Member Functions

- const std::string **Type** () const override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [DensityDistributionSpecs](#) > **Clone** () const override

Public Attributes

- std::string **type**
- double **fixed_density**
- std::uint64_t **workload_tensor_size**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/workload/density-models/fixed-structured-distribution.hpp

4.113 problem::UncompressedOffsetPair::Specs Struct Reference

Inheritance diagram for problem::UncompressedOffsetPair::Specs:

Collaboration diagram for problem::UncompressedOffsetPair::Specs:

Public Member Functions

- const std::string **Name** () const override
- bool **RankCompressed** () const override
- std::vector< problem::Shape::FlattenedDimensionID > **DimensionIDs** () const override
- std::uint32_t **MetadataWordBits** () const override
- std::uint32_t **PayloadWordBits** () const override
- void **SetMetadataWordBits** (std::uint32_t word_bits) override
- void **SetPayloadWordBits** (std::uint32_t word_bits) override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [MetadataFormatSpecs](#) > **Clone** () const override

Public Attributes

- std::string **name** = "uop"
- bool **rank_compressed** = false
- bool **coordinates_implicit** = true
- std::vector< problem::Shape::FlattenedDimensionID > **dimension_ids**
- std::uint32_t **metadata_word_bits**
- std::uint32_t **payload_word_bits**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/workload/format-models/uncompressed-offset-pair.hpp

4.114 problem::RunLengthEncoding::Specs Struct Reference

Inheritance diagram for problem::RunLengthEncoding::Specs:

Collaboration diagram for problem::RunLengthEncoding::Specs:

Public Member Functions

- const std::string **Name** () const override
- bool **RankCompressed** () const override
- std::vector< problem::Shape::FlattenedDimensionID > **DimensionIDs** () const override
- std::uint32_t **MetaDataWordBits** () const override
- std::uint32_t **PayloadWordBits** () const override
- void **SetMetaDataWordBits** (std::uint32_t word_bits) override
- void **SetPayloadWordBits** (std::uint32_t word_bits) override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [MetaDataFormatSpecs](#) > **Clone** () const override

Public Attributes

- std::string **name** = "rle"
- bool **rank_compressed** = true
- bool **coordinates_implicit** = false
- std::vector< problem::Shape::FlattenedDimensionID > **dimension_ids**
- std::uint32_t **metadata_width**
- std::uint32_t **payload_word_bits**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/workload/format-models/run-length-encoding.hpp

4.115 model::LegacyNetwork::Specs Struct Reference

Inheritance diagram for model::LegacyNetwork::Specs:

Collaboration diagram for model::LegacyNetwork::Specs:

Public Member Functions

- const std::string **Type** () const override
- bool **SupportAccelerergyTables** () const override
- void **ProcessERT** (const [config::CompoundConfigNode](#) &ERT) override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [NetworkSpecs](#) > **Clone** () const override

Public Attributes

- `std::string` **type**
- `std::string` **legacy_subtype**
- `Attribute< std::uint64_t >` **word_bits**
- `Attribute< double >` **router_energy**
- `Attribute< double >` **wire_energy**
- `Attribute< double >` **tile_width**
- `Attribute< double >` **energy_per_hop**
- `Attribute< std::uint64_t >` **fill_latency**
- `Attribute< std::uint64_t >` **drain_latency**
- `Attribute< bool >` **is_sparse_module**

Static Public Attributes

- `static const std::uint64_t` **kDefaultWordBits** = 16

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- `include/model/network-legacy.hpp`
- `src/model/network-legacy.cpp`

4.116 model::BufferLevel::Specs Struct Reference

Inheritance diagram for `model::BufferLevel::Specs`:

Collaboration diagram for `model::BufferLevel::Specs`:

Public Member Functions

- `const std::string` **Type** () const override
- `template<class Archive >`
void **serialize** (Archive &ar, const unsigned int version=0)
- `std::shared_ptr< LevelSpecs >` **Clone** () const override
- void **UpdateOpEnergyViaERT** (const std::map< std::string, double > &ERT_entries, const double max_↔energy) override
- void **UpdateAreaViaART** (const double component_area) override

Public Attributes

- [Attribute](#)< std::string > **name**
- [Attribute](#)< Technology > **technology**
- [Attribute](#)< std::uint64_t > **size**
- [Attribute](#)< std::uint64_t > **md_size**
- [Attribute](#)< std::uint64_t > **md_size_bits**
- [Attribute](#)< std::uint64_t > **word_bits**
- [Attribute](#)< std::uint64_t > **addr_gen_bits**
- [Attribute](#)< std::uint64_t > **block_size**
- [Attribute](#)< std::uint64_t > **cluster_size**
- [Attribute](#)< std::uint64_t > **instances**
- [Attribute](#)< std::uint64_t > **meshX**
- [Attribute](#)< std::uint64_t > **meshY**
- [Attribute](#)< double > **shared_bandwidth**
- [Attribute](#)< double > **read_bandwidth**
- [Attribute](#)< double > **write_bandwidth**
- [Attribute](#)< double > **multiple_buffering**
- [Attribute](#)< std::uint64_t > **effective_size**
- [Attribute](#)< std::uint64_t > **effective_md_size**
- [Attribute](#)< std::uint64_t > **effective_md_size_bits**
- [Attribute](#)< double > **min_utilization**
- [Attribute](#)< std::uint64_t > **num_ports**
- [Attribute](#)< std::uint64_t > **num_banks**
- [Attribute](#)< bool > **reduction_supported**
- [Attribute](#)< std::uint64_t > **network_fill_latency**
- [Attribute](#)< std::uint64_t > **network_drain_latency**
- [Attribute](#)< bool > **concordant_compressed_tile_traversal**
- [Attribute](#)< bool > **tile_partition_supported**
- [Attribute](#)< bool > **decompression_supported**
- [Attribute](#)< bool > **compression_supported**
- [Attribute](#)< std::uint64_t > **metadata_storage_width**
- [Attribute](#)< std::uint64_t > **metadata_storage_depth**
- [Attribute](#)< bool > **unified_data_md_storage**
- [Attribute](#)< std::uint64_t > **default_md_block_size**
- [Attribute](#)< std::uint64_t > **default_md_word_bits**
- [Attribute](#)< std::string > **read_network_name**
- [Attribute](#)< std::string > **fill_network_name**
- [Attribute](#)< std::string > **drain_network_name**
- [Attribute](#)< std::string > **update_network_name**
- [std::map](#)< std::string, double > **ERT_entries**
- [std::map](#)< std::string, double > **op_energy_map**
- [Attribute](#)< bool > **allow_overbooking**
- [Attribute](#)< double > **vector_access_energy**
- [Attribute](#)< double > **storage_area**
- [Attribute](#)< double > **addr_gen_energy**
- [std::string](#) **access_energy_source**
- [std::string](#) **addr_gen_energy_source**
- [std::string](#) **storage_area_source**
- [Attribute](#)< bool > **is_sparse_module**

Static Public Attributes

- static const std::uint64_t **kDefaultWordBits** = 16

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- include/model/buffer.hpp
- src/model/buffer.cpp

4.117 problem::Bitmask::Specs Struct Reference

Inheritance diagram for problem::Bitmask::Specs:

Collaboration diagram for problem::Bitmask::Specs:

Public Member Functions

- const std::string **Name** () const override
- bool **RankCompressed** () const override
- std::vector< problem::Shape::FlattenedDimensionID > **DimensionIDs** () const override
- std::uint32_t **MetadataWordBits** () const override
- std::uint32_t **PayloadWordBits** () const override
- void **SetMetadataWordBits** (std::uint32_t word_bits) override
- void **SetPayloadWordBits** (std::uint32_t word_bits) override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [MetadataFormatSpecs](#) > **Clone** () const override

Public Attributes

- std::string **name** = "b"
- bool **rank_compressed** = true
- bool **coordinates_implicit** = true
- std::vector< problem::Shape::FlattenedDimensionID > **dimension_ids**
- std::uint32_t **metadata_word_bits**
- std::uint32_t **payload_word_bits**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/workload/format-models/bitmask.hpp

4.118 problem::BandedDistribution::Specs Struct Reference

Inheritance diagram for problem::BandedDistribution::Specs:

Collaboration diagram for problem::BandedDistribution::Specs:

Public Member Functions

- const std::string **Type** () const override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [DensityDistributionSpecs](#) > **Clone** () const override

Public Attributes

- std::string **type**
- std::uint32_t **band_width**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/workload/density-models/banded-distribution.hpp

4.119 problem::HypergeometricDistribution::Specs Struct Reference

Inheritance diagram for problem::HypergeometricDistribution::Specs:

Collaboration diagram for problem::HypergeometricDistribution::Specs:

Public Member Functions

- const std::string **Type** () const override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- std::shared_ptr< [DensityDistributionSpecs](#) > **Clone** () const override

Public Attributes

- std::string **type**
- double **average_density**
- std::uint64_t **workload_tensor_size**
- double **total_nnzs**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/workload/density-models/hypergeometric-distribution.hpp

4.120 model::ArithmeticUnits::Specs Struct Reference

Inheritance diagram for model::ArithmeticUnits::Specs:

Collaboration diagram for model::ArithmeticUnits::Specs:

Public Member Functions

- const std::string **Type** () const override
- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- void **UpdateOpEnergyViaERT** (const std::map< std::string, double > &ERT_entries, const double max_↵ energy) override
- void **UpdateAreaViaART** (const double component_area) override
- std::shared_ptr< [LevelSpecs](#) > **Clone** () const override

Public Attributes

- [Attribute](#)< std::string > **name**
- [Attribute](#)< std::uint64_t > **instances**
- [Attribute](#)< std::uint64_t > **meshX**
- [Attribute](#)< std::uint64_t > **meshY**
- [Attribute](#)< std::uint64_t > **word_bits**
- [Attribute](#)< double > **energy_per_op**
- [Attribute](#)< double > **area**
- [Attribute](#)< std::string > **operand_network_name**
- [Attribute](#)< std::string > **result_network_name**
- [Attribute](#)< bool > **is_sparse_module**
- std::map< std::string, double > **ERT_entries**
- std::map< std::string, double > **op_energy_map**

Static Public Attributes

- static const std::uint64_t **kDefaultWordBits** = 16

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following files:

- include/model/arithmetic.hpp
- src/model/arithmetic.cpp

4.121 MapperThread::Stats Struct Reference

Collaboration diagram for MapperThread::Stats:

Public Member Functions

- void **UpdateFails** (FailClass fail_class, std::string fail_reason, unsigned level, const [Mapping](#) &mapping)

Public Attributes

- [EvaluationResult](#) **thread_best**
- [EvaluationResult](#) **index_factor_best**
- std::map< FailClass, std::map< unsigned, [FaillInfo](#) > > **fail_stats**
- std::default_random_engine **generator**
- std::uniform_real_distribution< double > **distribution**

The documentation for this struct was generated from the following files:

- include/applications/mapper/mapper-thread.hpp
- src/applications/mapper/mapper-thread.cpp

4.122 model::BufferLevel::Stats Struct Reference

Collaboration diagram for model::BufferLevel::Stats:

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- [problem::PerDataSpace](#)< bool > **keep**
- [problem::PerDataSpace](#)< std::uint64_t > **partition_size**
- [problem::PerDataSpace](#)< std::uint64_t > **utilized_capacity**
- [problem::PerDataSpace](#)< std::uint64_t > **utilized_md_capacity_bits**
- [problem::PerDataSpace](#)< std::uint64_t > **tile_size**
- [problem::PerDataSpace](#)< double > **utilized_instances**
- [problem::PerDataSpace](#)< std::uint64_t > **utilized_x_expansion**
- [problem::PerDataSpace](#)< std::uint64_t > **utilized_y_expansion**
- [problem::PerDataSpace](#)< std::uint64_t > **utilized_clusters**
- [problem::PerDataSpace](#)< std::uint64_t > **reads**
- [problem::PerDataSpace](#)< std::uint64_t > **updates**
- [problem::PerDataSpace](#)< std::uint64_t > **fills**
- [problem::PerDataSpace](#)< std::uint64_t > **address_generations**
- [problem::PerDataSpace](#)< std::uint64_t > **temporal_reductions**
- [problem::PerDataSpace](#)< double > **shared_bandwidth**

- [problem::PerDataSpace](#)< double > **read_bandwidth**
- [problem::PerDataSpace](#)< double > **write_bandwidth**
- [problem::PerDataSpace](#)< double > **energy_per_algorithmic_access**
- [problem::PerDataSpace](#)< double > **energy_per_access**
- [problem::PerDataSpace](#)< double > **energy**
- [problem::PerDataSpace](#)< double > **temporal_reduction_energy**
- [problem::PerDataSpace](#)< double > **addr_gen_energy**
- [problem::PerDataSpace](#)< double > **cluster_access_energy**
- [problem::PerDataSpace](#)< double > **cluster_access_energy_due_to_overflow**
- [problem::PerDataSpace](#)< double > **energy_due_to_overflow**
- [problem::PerDataSpace](#)< std::uint64_t > **tile_shape**
- [problem::PerDataSpace](#)< std::uint64_t > **data_tile_size**
- [problem::PerDataSpace](#)< bool > **compressed**
- [problem::PerDataSpace](#)< std::vector< std::vector< std::uint64_t > > > **metadata_tile_size**
- [problem::PerDataSpace](#)< std::uint64_t > **metadata_tile_size_bits**
- [problem::PerDataSpace](#)< std::string > **metadata_format**
- [problem::PerDataSpace](#)< double > **tile_confidence**
- [problem::PerDataSpace](#)< std::string > **parent_level_name**
- [problem::PerDataSpace](#)< unsigned > **parent_level_id**
- [problem::PerDataSpace](#)< std::string > **tile_density_distribution**
- [problem::PerDataSpace](#)< double > **format_shared_bandwidth_ratio**
- [problem::PerDataSpace](#)< double > **format_read_bandwidth_ratio**
- [problem::PerDataSpace](#)< double > **format_write_bandwidth_ratio**
- [problem::PerDataSpace](#)< std::map< std::string, std::uint64_t > > **fine_grained_scalar_accesses**
- [problem::PerDataSpace](#)< std::map< std::string, tiling::PerTileFormatAccesses > > **fine_grained_format↵
_scalar_accesses**
- [problem::PerDataSpace](#)< std::map< std::string, double > > **fine_grained_vector_accesses**
- [problem::PerDataSpace](#)< std::map< std::string, std::uint64_t > > **fine_grained_fromat_accesses_bits**
- [problem::PerDataSpace](#)< std::uint64_t > **gated_reads**
- [problem::PerDataSpace](#)< std::uint64_t > **skipped_reads**
- [problem::PerDataSpace](#)< std::uint64_t > **random_reads**
- [problem::PerDataSpace](#)< std::uint64_t > **gated_fills**
- [problem::PerDataSpace](#)< std::uint64_t > **skipped_fills**
- [problem::PerDataSpace](#)< std::uint64_t > **random_fills**
- [problem::PerDataSpace](#)< std::uint64_t > **gated_updates**
- [problem::PerDataSpace](#)< std::uint64_t > **skipped_updates**
- [problem::PerDataSpace](#)< std::uint64_t > **random_updates**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **random_format_reads**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **skipped_format_reads**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **gated_format_reads**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **random_format_fills**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **skipped_format_fills**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **gated_format_fills**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **random_format_updates**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **skipped_format_updates**
- [problem::PerDataSpace](#)< tiling::PerTileFormatAccesses > **gated_format_updates**
- [problem::PerDataSpace](#)< std::uint64_t > **decompression_counts**
- [problem::PerDataSpace](#)< std::uint64_t > **compression_counts**
- std::uint64_t **cycles**
- double **slowdown**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/model/buffer.hpp

4.123 model::Topology::Stats Struct Reference

Public Member Functions

- void **Reset** ()

Public Attributes

- double **energy**
- double **area**
- std::uint64_t **cycles**
- double **utilization**
- std::vector< [problem::PerDataSpace](#)< std::uint64_t > > **tile_sizes**
- std::vector< [problem::PerDataSpace](#)< std::uint64_t > > **utilized_capacities**
- std::vector< [problem::PerDataSpace](#)< std::uint64_t > > **utilized_instances**
- std::uint64_t **algorithmic_computes**
- std::uint64_t **actual_computes**
- std::uint64_t **last_level_accesses**
- std::vector< std::uint64_t > **accesses**
- std::vector< std::vector< std::uint64_t > > **per_tensor_accesses**

The documentation for this struct was generated from the following file:

- include/model/topology.hpp

4.124 model::SimpleMulticastNetwork::Stats Struct Reference

Collaboration diagram for model::SimpleMulticastNetwork::Stats:

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- [problem::PerDataSpace](#)< double > **energy**
- [problem::PerDataSpace](#)< std::uint64_t > **utilized_instances**
- [problem::PerDataSpace](#)< [AccessStatMatrix](#) > **ingresses**
- [problem::PerDataSpace](#)< std::uint64_t > **fanout**
- [problem::PerDataSpace](#)< std::uint64_t > **multicast_factor**
- std::uint64_t **fill_latency**
- std::uint64_t **drain_latency**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/model/network-simple-multicast.hpp

4.125 model::LegacyNetwork::Stats Struct Reference

Collaboration diagram for model::LegacyNetwork::Stats:

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- [problem::PerDataSpace](#)< std::uint64_t > **fanout**
- [problem::PerDataSpace](#)< std::uint64_t > **distributed_fanout**
- [problem::PerDataSpace](#)< std::uint64_t > **multicast_factor**
- [problem::PerDataSpace](#)< [AccessStatMatrix](#) > **ingresses**
- [problem::PerDataSpace](#)< bool > **distributed_multicast**
- [problem::PerDataSpace](#)< unsigned long > **link_transfers**
- [problem::PerDataSpace](#)< unsigned long > **spatial_reductions**
- [problem::PerDataSpace](#)< double > **link_transfer_energy**
- [problem::PerDataSpace](#)< double > **num_hops**
- [problem::PerDataSpace](#)< double > **energy_per_hop**
- [problem::PerDataSpace](#)< double > **energy**
- [problem::PerDataSpace](#)< double > **spatial_reduction_energy**
- std::uint64_t **fill_latency**
- std::uint64_t **drain_latency**
- [problem::PerDataSpace](#)< std::uint64_t > **utilized_instances**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/model/network-legacy.hpp

4.126 Application::Stats Struct Reference

Public Attributes

- double **energy**
- double **cycles**

The documentation for this struct was generated from the following file:

- include/applications/model/model.hpp

4.127 model::ReductionTreeNetwork::Stats Struct Reference

Collaboration diagram for model::ReductionTreeNetwork::Stats:

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)

Public Attributes

- [problem::PerDataSpace](#)< [AccessStatMatrix](#) > **ingresses**
- [problem::PerDataSpace](#)< unsigned long > **spatial_reductions**
- [problem::PerDataSpace](#)< double > **num_hops**
- [problem::PerDataSpace](#)< double > **energy_per_hop**
- [problem::PerDataSpace](#)< double > **energy**
- [problem::PerDataSpace](#)< double > **spatial_reduction_energy**
- std::uint64_t **fill_latency**
- std::uint64_t **drain_latency**
- [problem::PerDataSpace](#)< std::uint64_t > **utilized_instances**

Friends

- class **boost::serialization::access**

The documentation for this struct was generated from the following file:

- include/model/network-reduction-tree.hpp

4.128 mapspace::Status Struct Reference

Public Attributes

- bool **success**
- std::string **fail_reason**

The documentation for this struct was generated from the following file:

- include/mapspaces/mapspace-base.hpp

4.129 TaggedBound< K > Struct Template Reference

Public Attributes

- bool **valid**
- K **bound**

The documentation for this struct was generated from the following file:

- include/util/numeric.hpp

4.130 loop::Nest::SkewDescriptor::Term Struct Reference

Collaboration diagram for loop::Nest::SkewDescriptor::Term:

Classes

- struct [DimSpec](#)

Public Attributes

- int **constant** = 1
- [DimSpec](#) **variable**
- [DimSpec](#) **bound**

The documentation for this struct was generated from the following file:

- include/mapping/nest.hpp

4.131 model::Topology Class Reference

Inheritance diagram for model::Topology:

Collaboration diagram for model::Topology:

Classes

- class [Specs](#)
- struct [Stats](#)

Public Member Functions

- **Topology** (const [Topology](#) &other)
- [Topology](#) & **operator=** ([Topology](#) other)
- void **Spec** (const [Specs](#) &specs)
- void **Reset** ()
- unsigned **NumLevels** () const
- unsigned **NumStorageLevels** () const
- unsigned **NumNetworks** () const
- std::vector< [EvalStatus](#) > **PreEvaluationCheck** (const [Mapping](#) &mapping, [analysis::NestAnalysis](#) *analysis, [sparse::SparseOptimizationInfo](#) *sparse_optimizations, bool break_on_failure)
- std::vector< [EvalStatus](#) > **Evaluate** ([Mapping](#) &mapping, [analysis::NestAnalysis](#) *analysis, [sparse::SparseOptimizationInfo](#) *sparse_optimizations, bool break_on_failure)
- const [Stats](#) & **GetStats** () const
- const [Specs](#) & **GetSpecs** () const
- double **Energy** () const
- double **Area** () const
- std::uint64_t **Cycles** () const
- double **Utilization** () const
- std::vector< [problem::PerDataSpace](#)< std::uint64_t > > **TileSizes** () const
- std::vector< [problem::PerDataSpace](#)< std::uint64_t > > **UtilizedCapacities** () const
- std::vector< [problem::PerDataSpace](#)< std::uint64_t > > **UtilizedInstances** () const
- std::uint64_t **AlgorithmicComputes** () const
- std::uint64_t **ActualComputes** () const
- std::uint64_t **LastLevelAccesses** () const
- void **PrintOAVES** (std::ostream &out, [Mapping](#) &mapping, bool log_oaves_mappings, std::string oaves_prefix, unsigned thread_id) const
- void **OutputOAVESMappingYAML** ([Mapping](#) &mapping, std::string map_yaml_file_name) const

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) setting, [config::CompoundConfigNode](#) arithmetic_specs, bool is_sparse_topology)
- static [Specs](#) **ParseTreeSpecs** ([config::CompoundConfigNode](#) designRoot, bool is_sparse_topology)

Friends

- class **boost::serialization::access**
- void **swap** ([Topology](#) &first, [Topology](#) &second)
- std::ostream & **operator<<** (std::ostream &out, const [Topology](#) &sh)

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/model/topology.hpp
- src/model/topology.cpp

4.132 mapspace::Uber Class Reference

Inheritance diagram for mapspace::Uber:

Collaboration diagram for mapspace::Uber:

Public Member Functions

- **Uber** ([config::CompoundConfigNode](#) config, [config::CompoundConfigNode](#) arch_constraints, [model::Engine::Specs](#) arch_specs, const [problem::Workload](#) &workload, bool filter_spatial_fanout=true, bool skip_init=false)
- **Uber** (const [Uber](#) &other)=default
- void **Init** ([config::CompoundConfigNode](#) config, [config::CompoundConfigNode](#) arch_constraints)
- void **InitIndexFactorizationSpace** ()
- void **InitLoopPermutationSpace** (std::map< unsigned, std::vector< [problem::Shape::Flattened](#) ← DimensionID >> pruned_dimensions={})
- void **InitSpatialSpace** (std::map< unsigned, unsigned > unit_factors={})
- void **InitDatatypeBypassNestSpace** ()
- void **InitPruned** (uint128_t index_factorization_id)
- std::vector< [MapSpace](#) * > **Split** (std::uint64_t num_splits)
- void **InitSplit** (std::uint64_t split_id, uint128_t split_if_size, std::uint64_t num_parent_splits)
- bool **IsSplit** ()
- std::vector< [Status](#) > **ConstructMapping** ([mapspace::ID](#) mapping_id, [Mapping](#) *mapping, bool break_ ← on_failure=true)
- void **InitSubnests** (loop::NestConfig &subnests)
- void **PermuteSubnests** (uint128_t mapping_permutation_id, loop::NestConfig &subnests)
- void **AssignIndexFactors** (uint128_t mapping_index_factorization_id, loop::NestConfig &subnests)
- std::vector< [Status](#) > **AssignSpatialTilingDirections** (uint128_t mapping_spatial_id, loop::NestConfig &subnests, [tiling::CompoundMaskNest](#) datatype_bypass_nest, bool break_on_failure)
- [Status](#) **AssignSpatialTilingDirections_Level_Expand** (std::uint32_t spatial_split, std::vector< [loop::Descriptor](#) > &level_nest, unsigned tiling_level_id, double &fanout_utilization)
- [tiling::CompoundMaskNest](#) **ConstructDatatypeBypassNest** (uint128_t mapping_datatype_bypass_id)
- void **Parse** ([config::CompoundConfigNode](#) config, [config::CompoundConfigNode](#) arch_constraints)

Protected Attributes

- [PermutationSpace](#) permutation_space_
- [IndexFactorizationSpace](#) index_factorization_space_
- [SpatialSplitSpace](#) spatial_split_space_
- std::vector< [tiling::CompoundMaskNest](#) > datatype_bypass_nest_space_
- std::vector< [Uber](#) * > splits_
- std::uint64_t split_id_
- std::uint64_t num_parent_splits_
- [ArchProperties](#) arch_props_
- [mapping::Constraints](#) constraints_
- bool filter_spatial_fanout_

The documentation for this class was generated from the following files:

- include/mapspaces/uber.hpp
- src/mapspaces/uber.cpp

4.133 problem::UncompressedBitmask Class Reference

Inheritance diagram for problem::UncompressedBitmask:

Collaboration diagram for problem::UncompressedBitmask:

Classes

- struct [Specs](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **UncompressedBitmask** (const [Specs](#) &specs)
- [PerRankMetaDataTileOccupancy](#) **GetOccupancy** (const [MetaDataOccupancyQuery](#) &query) const
- bool **RankCompressed** () const
- bool **CoordinatesImplicit** () const
- std::vector< problem::Shape::FlattenedDimensionID > **GetDimensionIDs** () const
- std::string **GetFormatName** () const
- bool **MetaDataImplicitAsLowestRank** () const
- const [MetaDataFormatSpecs](#) & **GetSpecs** () const

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) metadata_config)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/format-models/uncompressed-bitmask.hpp
- src/workload/format-models/uncompressed-bitmask.cpp

4.134 problem::UncompressedOffsetPair Class Reference

Inheritance diagram for problem::UncompressedOffsetPair:

Collaboration diagram for problem::UncompressedOffsetPair:

Classes

- struct [Specs](#)

Public Member Functions

- template<class Archive >
void **serialize** (Archive &ar, const unsigned int version=0)
- **UncompressedOffsetPair** (const [Specs](#) &specs)
- **PerRankMetaDataTileOccupancy GetOccupancy** (const [MetaDataOccupancyQuery](#) &query) const
- bool **RankCompressed** () const
- bool **CoordinatesImplicit** () const
- std::vector< problem::Shape::FlattenedDimensionID > **GetDimensionIDs** () const
- std::string **GetFormatName** () const
- bool **MetaDataImplicitAsLowestRank** () const
- const [MetaDataFormatSpecs](#) & **GetSpecs** () const

Static Public Member Functions

- static [Specs](#) **ParseSpecs** ([config::CompoundConfigNode](#) metadata_config)

Friends

- class **boost::serialization::access**

The documentation for this class was generated from the following files:

- include/workload/format-models/uncompressed-offset-pair.hpp
- src/workload/format-models/uncompressed-offset-pair.cpp

4.135 problem::Workload Class Reference

Collaboration diagram for problem::Workload:

Public Types

- typedef std::map< Shape::FactorizedDimensionID, Coordinate > **FactorizedBounds**
- typedef std::map< Shape::FlattenedDimensionID, Coordinate > **FlattenedBounds**
- typedef std::map< Shape::CoefficientID, int > **Coefficients**
- typedef std::map< Shape::DataSpaceID, std::shared_ptr< [DensityDistribution](#) > > **Densities**

Public Member Functions

- const [Shape](#) * **GetShape** () const
- int **GetFactorizedBound** (Shape::FactorizedDimensionID dim) const
- int **GetFlattenedBound** (Shape::FlattenedDimensionID dim) const
- [Point](#) **GetFactorizedBounds** () const
- int **GetCoefficient** (Shape::CoefficientID p) const
- std::shared_ptr< [DensityDistribution](#) > **GetDensity** (Shape::DataSpaceID pv) const
- bool **GetDenseDefaultTensor** () const
- void **DeriveFlattenedBounds** ()
- void **SetFactorizedBounds** (const FactorizedBounds &factorized_bounds)
- void **SetCoefficients** (const Coefficients &coefficients)
- void **SetDensities** (const Densities &densities)
- void **SetWorkloadTensorSize** (problem::Shape::DataSpaceID id, problem::DataSpace &point_set)
- bool **IsWorkloadTensorSizesSet** ()
- void **AllTensorsSet** ()
- void **SetDefaultDenseTensorFlag** (const bool flag)
- void **ParseShape** ([config::CompoundConfigNode](#) config)

Protected Attributes

- FactorizedBounds **factorized_bounds_**
- FlattenedBounds **flattened_bounds_**
- Coefficients **coefficients_**
- Densities **densities_**
- bool **workload_tensor_size_set_** = false
- bool **default_dense_** = true
- [Shape](#) **shape_**

Static Protected Attributes

- static bool **workload_alive_** = false
- static const [Shape](#) * **current_shape_** = nullptr

Friends

- class **boost::serialization::access**
- const friend [Shape](#) * **GetShape** ()

The documentation for this class was generated from the following files:

- include/workload/workload.hpp
- src/workload/workload.cpp

Index

AccessStatMatrix, [11](#)
AccessStats, [12](#)
analysis::CompoundTileNest, [26](#)
analysis::ComputeInfo, [28](#)
analysis::DataMovementInfo, [33](#)
analysis::ElementState, [37](#)
analysis::LoopState, [49](#)
analysis::NestAnalysis, [56](#)
Application, [13](#)
Application::Stats, [91](#)
ArchProperties, [13](#)
ArchSpace, [14](#)
ArchSpaceNode, [14](#)
ArchSweepNode, [14](#)
AxisAlignedHyperRectangle, [16](#)

CartesianCounter< order >, [21](#)
CartesianCounterDynamic, [21](#)
CartesianCounterGeneric< T >, [22](#)
config::CompoundConfig, [22](#)
config::CompoundConfigNode, [23](#)
 instantiateKey, [24](#)
 push_back, [24](#)
 resolve, [25](#)
 setScalar, [25](#)

DesignSpaceExplorer, [36](#)
DynamicArray< T >, [37](#)

EvaluationResult, [39](#)

Factoradic< T >, [41](#)
Factors, [41](#)
FailInfo, [42](#)

Gradient, [43](#)

instantiateKey
 config::CompoundConfigNode, [24](#)
ISLPointSet, [45](#)

loop::Descriptor, [35](#)
loop::Nest, [55](#)
loop::Nest::SkewDescriptor, [73](#)
loop::Nest::SkewDescriptor::Term, [92](#)
loop::Nest::SkewDescriptor::Term::DimSpec, [36](#)

MapperThread, [49](#)
MapperThread::Stats, [87](#)
Mapping, [50](#)
mapping::Constraints, [28](#)

mapspace::IndexFactorizationSpace, [45](#)
mapspace::MapSpace, [51](#)
mapspace::PermutationSpace, [61](#)
mapspace::ResidualIndexFactorizationSpace, [67](#)
mapspace::Ruby, [67](#)
mapspace::RubyPermutationSpace, [68](#)
mapspace::SpatialSplitSpace, [75](#)
mapspace::Status, [92](#)
mapspace::Uber, [94](#)
model::ArithmeticUnits, [15](#)
model::ArithmeticUnits::Specs, [86](#)
model::Attribute< T >, [16](#)
model::BufferLevel, [19](#)
model::BufferLevel::Specs, [82](#)
model::BufferLevel::Stats, [87](#)
model::Engine, [38](#)
model::Engine::Specs, [79](#)
model::EvalStatus, [39](#)
model::LegacyNetwork, [46](#)
model::LegacyNetwork::Specs, [81](#)
model::LegacyNetwork::Stats, [90](#)
model::Level, [47](#)
model::LevelSpecs, [48](#)
model::Module, [54](#)
model::Network, [56](#)
model::NetworkFactory, [57](#)
model::NetworkSpecs, [58](#)
model::ReductionTreeNetwork, [65](#)
model::ReductionTreeNetwork::Specs, [78](#)
model::ReductionTreeNetwork::Stats, [91](#)
model::SimpleMulticastNetwork, [72](#)
model::SimpleMulticastNetwork::Specs, [77](#)
model::SimpleMulticastNetwork::Stats, [89](#)
model::Topology, [93](#)
model::Topology::Specs, [75](#)
model::Topology::Stats, [89](#)
MultiAAHR, [54](#)

PatternGenerator128, [59](#)
Point, [62](#)
PointResult, [63](#)
problem::BandedDistribution, [17](#)
problem::BandedDistribution::Specs, [85](#)
problem::Bitmask, [18](#)
problem::Bitmask::Specs, [84](#)
problem::CoordinatePayload, [30](#)
problem::CoordinatePayload::Specs, [76](#)
problem::DensityDistribution, [33](#)
problem::DensityDistributionFactory, [34](#)
problem::DensityDistributionSpecs, [34](#)

- problem::DensityModelIncapability, [35](#)
- problem::FixedStructuredDistribution, [42](#)
- problem::FixedStructuredDistribution::Specs, [79](#)
- problem::HypergeometricDistribution, [44](#)
- problem::HypergeometricDistribution::Specs, [85](#)
- problem::MetaDataFormat, [51](#)
- problem::MetaDataFormatFactory, [52](#)
- problem::MetaDataFormatSpecs, [52](#)
- problem::MetaDataOccupancyQuery, [53](#)
- problem::OperationPoint, [58](#)
- problem::OperationSpace, [59](#)
- problem::PerDataSpace< T >, [60](#)
- problem::PerFlattenedDimension< T >, [61](#)
- problem::PerRankMetaDataTileOccupancy, [62](#)
- problem::RunLengthEncoding, [69](#)
- problem::RunLengthEncoding::Specs, [81](#)
- problem::Shape, [71](#)
- problem::UncompressedBitmask, [95](#)
- problem::UncompressedBitmask::Specs, [76](#)
- problem::UncompressedOffsetPair, [95](#)
- problem::UncompressedOffsetPair::Specs, [80](#)
- problem::Workload, [96](#)
- ProblemSpace, [63](#)
- ProblemSpaceNode, [64](#)
- push_back
 - config::CompoundConfigNode, [24](#)
- RandomGenerator128, [64](#)
- ResidualFactors, [67](#)
- resolve
 - config::CompoundConfigNode, [25](#)
- search::ExhaustiveSearch, [40](#)
- search::HybridSearch, [43](#)
- search::LinearPrunedSearch, [48](#)
- search::RandomPrunedSearch, [65](#)
- search::RandomSearch, [65](#)
- search::SearchAlgorithm, [70](#)
- SequenceGenerator128, [70](#)
- setScalar
 - config::CompoundConfigNode, [25](#)
- sparse::ActionOptimization, [13](#)
- sparse::CompressionInfo, [27](#)
- sparse::ConditionedOnOptimization, [28](#)
- sparse::ExplicitReadOptimizationImpact, [40](#)
- sparse::PerDataSpaceCompressionInfo, [60](#)
- sparse::SetOfOperationSpaces, [70](#)
- sparse::SparseAnalysisState, [73](#)
- sparse::SparseOptimizationInfo, [74](#)
- sparse::SpatialExpansion, [74](#)
- TaggedBound< K >, [92](#)
- tiling::CompoundTile, [26](#)
- tiling::CompoundTileNest, [26](#)
- tiling::ComputeInfo, [27](#)
- tiling::CoordinateSpaceTileInfo, [30](#)
- tiling::DataMovementInfo, [31](#)
- tiling::ExtraTileConstraintInfo, [40](#)