SheafSystem Programmer's Guide

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Summary

This document shows how to use key features of the SheafSystem.

# Introduction

# Getting started

## PartSpace metaphor

Reference to PartSpaces docs, basic and composite parts, tables, namespace tables

## Namespaces

Notion of a namespace. Sheaf, fiber bundle, and geometry namespaces.

Example 1: Hello, Sheaf!

Disable access guards, promise to explain later.

Create sheaves namespace named Hello, sheaf.

Write name to stdout.

# Programming patterns

Design features shared by all the classes in the SheafSystem

## Design by contract

DBC pattern: class invaraint, pre- and post-condtions for member functions. Contract metaphor: proper usage ensures proper results. Contracts are essential part of documentation. Contracts are not error detection.

Example : contract for sheaves\_namespace constructor.

Precondition - has to have a valid name. Explore valid name docs.

Explore postconditions

## Concurrency control

Monitor paradigm. global control, basic protocol. Enforce by preconditions.

Example : sheaves\_namespace∷name

Contrast poset\_state\_handle∷name with poset\_state\_handle∷name(bool). Show blown assertion

## Index spaces and scoped indices, part 1

## Index spaces

Basic notion, iterators.

Example : iterating over members of name space

Iterate over all members of namespace, then over member posets.

Demostrate need for scoped ids by printing out pods in both cases.

## Scoped ids

Basic notion. Examples using namespace member functions.

# Storage\_agent

Basic idea.

Example : write namespace to file

# Viewing Namespaces

## Stream insertion operator

Example : write namespace to cout

Write name to std out as a poset and as a namespace.

## Read.t

Example: view namespace with read.t

## SheafScope

Example: view namespace with SheafScope

# Posets

Example 7: creating, accessing, and deleting posets

## Creating posets

Create a poset, write to cout.

## Accessing posets

Three common signatures, poset path

Example: access poset and write to cout.

## Deleteing posets

Delete the poset.

# Poset members

Example : creating andd manipulating poset members with the poset interface

## Creating poset members

Create a jim

## Accessing poset members

Naming, various queries

## Ordering poset members

## Deleting poset members

## Handles

Repeat all the same examples with handles

## Schema posets