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.

### Hello, sheaf

Create sheaves namespace named Hello, sheaf. Write name to stdout. Emphasize content is just basic capability.

### Hello, fiber bundle

Create fiber bundle namespace name Hello, fiber bundle. Write name to stdout. Emphasize content is schema for scientific computing. Contrast with sheaves namespace.

Exercise: do the same thing for geometry.

# Programming patterns

Design features shared by all the classes in the SheafSystem

## Design by contract

DBC pattern. Contracts are essential part of documentation.

Example: precondition for sheaves\_namespace constructor. Need example of postcondition and invariant.

Namespace\_poset ctor has pre and post conditions that aren't propagated to sheaves namespace. Has invariant as well.

## Concurrency control

Example: name(bool) function on namespace.

## Index spaces and scoped indices, part 1

## Index spaces

Basic notion, iterators.

Example: iterating over members of name space.

## Scoped ids

Basic notion. Examples using namespace member functions.

# Storage\_agent

Basic idea. Example, write namespace to file.

# Viewing Namespaces

## SheafScope

Example: view namespace with SheafScope

## Stream insertion operator

Example: write namespace to cout.

# 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

## 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