GazeboMessages

1.9.0

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Contents

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Gazebo Messages Reference

Gazebo uses Google Protobufs for message specification and serialization.

Messages Definitions

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2.1 Class List

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Chapter 3

File Index

3.1 File List

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Chapter 4

Class Documentation

4.1 Axis Interface Reference

msgs::Joint axis message

4.1.1 Detailed Description

msgs::Joint axis message

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

- **axis.proto**

4.2 BoxGeom Interface Reference

Information about a box geometry.

4.2.1 Detailed Description

Information about a box geometry.

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

- **boxgeom.proto**

4.3 CameraSensor Interface Reference

Information about a camera sensor element.

4.3.1 Detailed Description

Information about a camera sensor element.

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

- **camerasensor.proto**

4.4 Collision Interface Reference

Information about a collision element.

4.4.1 Detailed Description

Information about a collision element.

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

- **collision.proto**

4.5 Color Interface Reference

Color (p. 12) message.

4.5.1 Detailed Description

Color (p. 12) message.

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

- **color.proto**

4.6 Contact Interface Reference

Contact (p. 12) message for passing info between two entities.

4.6.1 Detailed Description

Contact (p. 12) message for passing info between two entities.

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

- **contact.proto**

4.7 Contacts Interface Reference

Contacts (p. 12) from collision detection.

4.7.1 Detailed Description

Contacts (p. 12) from collision detection.

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

- **contacts.proto**

4.8 ContactSensor Interface Reference

Information about a contact sensor element.

4.8.1 Detailed Description

Information about a contact sensor element.

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

- **contactsensor.proto**

4.9 CylinderGeom Interface Reference

Information about a cylinder geometry.

4.9.1 Detailed Description

Information about a cylinder geometry.

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

- **cylindergeom.proto**

4.10 Diagnostic Interface Reference

Diagnostic (p. 13) information about a running instance of Gazebo.

4.10.1 Detailed Description

Diagnostic (p. 13) information about a running instance of Gazebo.

Gazebo must have been compiled with the ENABLE_DIAGNOSTICS flag.

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

- **diagnostics.proto**

4.11 Entities Interface Reference

Information about all entities in a world.

4.11.1 Detailed Description

Information about all entities in a world.

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

- **model_v.proto**

4.12 Factory Interface Reference

Message to create new model in gazebo.

4.12.1 Detailed Description

Message to create new model in gazebo.

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

- **factory.proto**

4.13 Fog Interface Reference

Message for fog data.

4.13.1 Detailed Description

Message for fog data.

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

- **fog.proto**

4.14 ForceTorque Interface Reference

ForceTorque (p. 14) from constraint solving.

4.14.1 Detailed Description

ForceTorque (p. 14) from constraint solving.

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

- **joint_wrench_stamped.proto**

4.15 Frction Interface Reference

Information about friction.

4.15.1 Detailed Description

Information about friction.

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

- **friction.proto**

4.16 Geometry Interface Reference

Information about a geometry element.

4.16.1 Detailed Description

Information about a geometry element.

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

- **geometry.proto**

4.17 GUI Interface Reference

Message for a **GUI** (p. 15).

4.17.1 Detailed Description

Message for a **GUI** (p. 15).

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

- **gui.proto**

4.18 GUICamera Interface Reference

Message for a **GUI** (p. 15) Camera.

4.18.1 Detailed Description

Message for a **GUI** (p. 15) Camera.

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

- **gui_camera.proto**

4.19 GUIOverlayConfig Interface Reference

Message for a gui overlay configuration.

4.19.1 Detailed Description

Message for a gui overlay configuration.

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

- **gui_overlay_config.proto**

4.20 GzString Interface Reference

A message for string data.

4.20.1 Detailed Description

A message for string data.

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

- **gz_string.proto**

4.21 GzString_V Interface Reference

A message for a vector of string data.

4.21.1 Detailed Description

A message for a vector of string data.

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

- **gz_string_v.proto**

4.22 Header Interface Reference

General information included by many messages.

4.22.1 Detailed Description

General information included by many messages.

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

- **header.proto**

4.23 HeightmapGeom Interface Reference

Message for a heightmap geometry.

4.23.1 Detailed Description

Message for a heightmap geometry.

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

- **heightmapgeom.proto**

4.24 Image Interface Reference

Message for an image.

4.24.1 Detailed Description

Message for an image.

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

- **image.proto**

4.25 ImageGeom Interface Reference

Message for a image geometry.

4.25.1 Detailed Description

Message for a image geometry.

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

- **imagegeom.proto**

4.26 ImagesStamped Interface Reference

Message for a multiple image with a time.

4.26.1 Detailed Description

Message for a multiple image with a time.

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

- **images_stamped.proto**

4.27 ImageStamped Interface Reference

Message for an image with a time.

4.27.1 Detailed Description

Message for an image with a time.

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

- **image_stamped.proto**

4.28 IMU Interface Reference

Data from an **IMU** (p. 18) sensor.

4.28.1 Detailed Description

Data from an **IMU** (p. 18) sensor.

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

- **imu.proto**

4.29 Inertial Interface Reference

Information about inertia.

4.29.1 Detailed Description

Information about inertia.

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

- **inertial.proto**

4.30 Int Interface Reference

Integer message.

4.30.1 Detailed Description

Integer message.

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

- **int.proto**

4.31 Joint Interface Reference

Message for creating joint in rendering::Scene.

4.31.1 Detailed Description

Message for creating joint in rendering::Scene.

Joint (p. 19) wrench message.

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

- **joint.proto**

4.32 JointAnimation Interface Reference

Message for a model joint animation, does not appear to be used.

4.32.1 Detailed Description

Message for a model joint animation, does not appear to be used.

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

- **joint_animation.proto**

4.33 JointCmd Interface Reference

Message for joint command, used by physics::JointControlWidget.

4.33.1 Detailed Description

Message for joint command, used by physics::JointControlWidget.

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

- **joint_cmd.proto**

4.34 LaserScan Interface Reference

Data from a laser scan.

4.34.1 Detailed Description

Data from a laser scan.

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

- **laserscan.proto**

4.35 LaserStamped Interface Reference

Message for an laser scan with a time.

4.35.1 Detailed Description

Message for an laser scan with a time.

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

- **laserscan_stamped.proto**

4.36 Light Interface Reference

Message for a light.

4.36.1 Detailed Description

Message for a light.

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

- **light.proto**

4.37 Link Interface Reference

Information about a link.

4.37.1 Detailed Description

Information about a link.

Timestamped link data.

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

- **link.proto**

4.38 LogControl Interface Reference

A message that allows for control of logging functions.

4.38.1 Detailed Description

A message that allows for control of logging functions.

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

- **log_control.proto**

4.39 LogStatus Interface Reference

A message that contains information about data logging.

4.39.1 Detailed Description

A message that contains information about data logging.

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

- **log_status.proto**

4.40 Material Interface Reference

Information about a material.

4.40.1 Detailed Description

Information about a material.

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

- **material.proto**

4.41 MeshGeom Interface Reference

Message for a mesh geometry.

4.41.1 Detailed Description

Message for a mesh geometry.

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

- **meshgeom.proto**

4.42 Model Interface Reference

Information about a model.

4.42.1 Detailed Description

Information about a model.

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

- **model.proto**

4.43 ModelConfiguration Interface Reference

Message for model configuration (joint positions)

4.43.1 Detailed Description

Message for model configuration (joint positions)

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

- **model_configuration.proto**

4.44 Packet Interface Reference

Message that encapsulates another message with a type description.

4.44.1 Detailed Description

Message that encapsulates another message with a type description.

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

- **packet.proto**

4.45 Physics Interface Reference

A message containing a description of the global physics properties.

4.45.1 Detailed Description

A message containing a description of the global physics properties.

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

- **physics.proto**

4.46 PID Interface Reference

Message for simple **PID** (p. 22) controllers.

4.46.1 Detailed Description

Message for simple **PID** (p. 22) controllers.

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

- **pid.proto**

4.47 PlaneGeom Interface Reference

Message for a plane geometry.

4.47.1 Detailed Description

Message for a plane geometry.

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

- **planegeom.proto**

4.48 Plugin Interface Reference

A message containing visual information for gazebo::Plugin.

4.48.1 Detailed Description

A message containing visual information for gazebo::Plugin.

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

- **plugin.proto**

4.49 Point Interface Reference

A point cloud.

4.49.1 Detailed Description

A point cloud.

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

- **pointcloud.proto**

4.50 Pose Interface Reference

Message for a pose.

4.50.1 Detailed Description

Message for a pose.

Message for a vector of poses.

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

- **pose.proto**

4.51 PoseAnimation Interface Reference

Message for a model pose animation.

4.51.1 Detailed Description

Message for a model pose animation.

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

- **pose_animation.proto**

4.52 PosesStamped Interface Reference

Message for a vector of poses with a time stamp.

4.52.1 Detailed Description

Message for a vector of poses with a time stamp.

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

- **poses_stamped.proto**

4.53 PoseStamped Interface Reference

Message for a pose with a time.

4.53.1 Detailed Description

Message for a pose with a time.

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

- **pose_stamped.proto**

4.54 PoseTrajectory Interface Reference

Message for a pose trajectory.

4.54.1 Detailed Description

Message for a pose trajectory.

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

- **pose_trajectory.proto**

4.55 Projector Interface Reference

Information about a projector.

4.55.1 Detailed Description

Information about a projector.

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

- **projector.proto**

4.56 Publish Interface Reference

Message that contains information about a publisher of data.

4.56.1 Detailed Description

Message that contains information about a publisher of data.

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

- **publish.proto**

4.57 Publishers Interface Reference

A list of publishers.

4.57.1 Detailed Description

A list of publishers.

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

- **publishers.proto**

4.58 Quaternion Interface Reference

A message for a quaternion.

4.58.1 Detailed Description

A message for a quaternion.

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

- **quaternion.proto**

4.59 RaySensor Interface Reference

Information about a ray sensor element.

4.59.1 Detailed Description

Information about a ray sensor element.

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

- **raysensor.proto**

4.60 Request Interface Reference

A message containing a string request.

4.60.1 Detailed Description

A message containing a string request.

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

- **request.proto**

4.61 Response Interface Reference

Message that encapsulates a respons message with a type description.

4.61.1 Detailed Description

Message that encapsulates a respons message with a type description.

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

- **response.proto**

4.62 Road Interface Reference

Message for a road.

4.62.1 Detailed Description

Message for a road.

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

- **road.proto**

4.63 Scene Interface Reference

A message containing a description of a scene.

4.63.1 Detailed Description

A message containing a description of a scene.

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

- **scene.proto**

4.64 Selection Interface Reference

A message for **GUI** (p. 15) selection data.

4.64.1 Detailed Description

A message for **GUI** (p. 15) selection data.

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

- **selection.proto**

4.65 Sensor Interface Reference

Information about a sensor element.

4.65.1 Detailed Description

Information about a sensor element.

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

- **sensor.proto**

4.66 ServerControl Interface Reference

A message that allows for control of the server functions.

4.66.1 Detailed Description

A message that allows for control of the server functions.

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

- **server_control.proto**

4.67 Shadows Interface Reference

A message for shadow data.

4.67.1 Detailed Description

A message for shadow data.

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

- **shadows.proto**

4.68 Sky Interface Reference

Information about the sky.

4.68.1 Detailed Description

Information about the sky.

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

- **sky.proto**

4.69 Sonar Interface Reference

Message for a sonar value.

4.69.1 Detailed Description

Message for a sonar value.

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

- **sonar.proto**

4.70 SonarStamped Interface Reference

Message for a time stamped sonar value.

4.70.1 Detailed Description

Message for a time stamped sonar value.

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

- **sonar_stamped.proto**

4.71 SphereGeom Interface Reference

Information about a sphere geometry.

4.71.1 Detailed Description

Information about a sphere geometry.

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

- **spheregeom.proto**

4.72 Subscribe Interface Reference

A message for subscription data.

4.72.1 Detailed Description

A message for subscription data.

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

- **subscribe.proto**

4.73 Surface Interface Reference

Information about a surface element.

4.73.1 Detailed Description

Information about a surface element.

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

- **surface.proto**

4.74 Tactile Interface Reference

Message for a tactile data.

4.74.1 Detailed Description

Message for a tactile data.

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

- **tactile.proto**

4.75 Test Interface Reference

A test message.

4.75.1 Detailed Description

A test message.

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

- **test.proto**

4.76 Time Interface Reference

A message for time data.

4.76.1 Detailed Description

A message for time data.

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

- **time.proto**

4.77 TopicInfo Interface Reference

A message for topic information.

4.77.1 Detailed Description

A message for topic information.

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

- **topic_info.proto**

4.78 Trackvisual Interface Reference

Message for a trackking a rendering::Visual with a rendering::Camera.

4.78.1 Detailed Description

Message for a trackking a rendering::Visual with a rendering::Camera.

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

- **track_visual.proto**

4.79 Vector2d Interface Reference

Message for a vector2 double.

4.79.1 Detailed Description

Message for a vector2 double.

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

- **vector2d.proto**

4.80 Vector3d Interface Reference

Message for a vector3 double.

4.80.1 Detailed Description

Message for a vector3 double.

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

- **vector3d.proto**

4.81 Visual Interface Reference

A message containing visual information for rendering::Visual.

4.81.1 Detailed Description

A message containing visual information for rendering::Visual.

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

- **visual.proto**

4.82 WorldControl Interface Reference

A message that allows for control of world functions.

4.82.1 Detailed Description

A message that allows for control of world functions.

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

- **world_control.proto**

4.83 WorldModify Interface Reference

A message that allows for modifying (open, close) worlds.

4.83.1 Detailed Description

A message that allows for modifying (open, close) worlds.

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

- **world_modify.proto**

4.84 WorldReset Interface Reference

A message that controls how the world is reset.

4.84.1 Detailed Description

A message that controls how the world is reset.

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

- **world_reset.proto**

4.85 WorldStatistics Interface Reference

A message statiscs about a world.

4.85.1 Detailed Description

A message statiscs about a world.

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

- **world_stats.proto**

4.86 Wrench Interface Reference

Message for a wrench value.

4.86.1 Detailed Description

Message for a wrench value.

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

- **wrench.proto**

4.87 WrenchStamped Interface Reference

Message for a time stamped wrench value.

4.87.1 Detailed Description

Message for a time stamped wrench value.

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

- **wrench_stamped.proto**

Chapter 5

File Documentation

5.1 axis.proto File Reference

Variables

- message **Axis**
- required double **damping** = 6
- required double **friction** = 7
- required double **limit_effort** = 4
- required double **limit_lower** = 2
- required double **limit_upper** = 3
- required double **limit_velocity** = 5
- package gazebo **msgs**
- import vector3d **proto**

5.1.1 Variable Documentation

5.1.1.1 message Axis

Initial value:

```
{
  required Vector3d xyz          = 1
```

5.1.1.2 required double damping = 6

5.1.1.3 required double friction = 7

5.1.1.4 required double limit_effort = 4

5.1.1.5 required double limit_lower = 2

5.1.1.6 required double limit_upper = 3

5.1.1.7 required double limit_velocity = 5

5.1.1.8 package gazebo msgs

5.1.1.9 import wrench proto

5.2 boxgeom.proto File Reference

Variables

- message **BoxGeom**
- package gazebo **msgs**
- import vector3d **proto**

5.2.1 Variable Documentation

5.2.1.1 message BoxGeom

Initial value:

```
{
  required Vector3d size  = 1
```

5.2.1.2 package gazebo msgs

5.2.1.3 import vector3d proto

5.3 camerasensor.proto File Reference

Variables

- message **CameraSensor**
- optional double **far_clip** = 5
- optional string **image_format** = 3
- optional **Vector2d image_size** = 2
- package gazebo **msgs**
- optional double **near_clip** = 4
- import vector2d **proto**
- optional bool **save_enabled** = 6
- optional string **save_path** = 7

5.3.1 Variable Documentation

5.3.1.1 message CameraSensor

Initial value:

```
{
  optional double horizontal_fov = 1
```

5.3.1.2 optional double far_clip = 5

5.3.1.3 optional string image_format = 3

5.3.1.4 optional Vector2d image_size = 2

5.3.1.5 package gazebo msgs

5.3.1.6 optional double near_clip = 4

5.3.1.7 import vector2d proto

5.3.1.8 optional bool save_enabled = 6

5.3.1.9 optional string save_path = 7

5.4 collision.proto File Reference

Variables

- message **Collision**
- optional **Geometry geometry** = 6
- optional double **laser_retro** = 3
- optional double **max_contacts** = 4
- package gazebo **msgs**
- required string **name** = 2
- optional **Pose pose** = 5
- import header **proto**
- optional **Surface surface** = 7
- repeated **Visual visual** = 8

5.4.1 Variable Documentation

5.4.1.1 message Collision

Initial value:

```
{
  required uint32 id            = 1
```

5.4.1.2 optional Geometry geometry = 6

5.4.1.3 optional double laser_retro = 3

5.4.1.4 optional double max_contacts = 4

5.4.1.5 package gazebo msgs

5.4.1.6 required string name = 2

5.4.1.7 optional Pose pose = 5

5.4.1.8 import visual proto

5.4.1.9 optional Surface surface = 7

5.4.1.10 repeated Visual visual = 8

5.5 color.proto File Reference

Variables

- optional float **a** = 5 [default = 1.0]
- required float **b** = 4
- message **Color**
- required float **g** = 3
- package gazebo **msgs**

5.5.1 Variable Documentation

5.5.1.1 optional float a = 5 [default = 1.0]

5.5.1.2 required float b = 4

5.5.1.3 message Color

Initial value:

```
{
  required float r = 2
```

5.5.1.4 required float g = 3

5.5.1.5 package gazebo msgs

5.6 contact.proto File Reference

Variables

- required string **collision2** = 2
- message **Contact**
- repeated double **depth** = 5
- package gazebo **msgs**
- repeated **Vector3d normal** = 4
- repeated **Vector3d position** = 3
- import vector3d **proto**
- required **Time time** = 7
- required string **world** = 8
- repeated **JointWrench wrench** = 6

5.6.1 Variable Documentation

5.6.1.1 required string collision2 = 2

5.6.1.2 message Contact

Initial value:

```
{
  required string collision1 = 1
```

5.6.1.3 repeated double depth = 5

5.6.1.4 package gazebo msgs

5.6.1.5 repeated Vector3d normal = 4

5.6.1.6 repeated Vector3d position = 3

5.6.1.7 import joint_wrench proto

5.6.1.8 required Time time = 7

5.6.1.9 required string world = 8

5.6.1.10 repeated JointWrench wrench = 6

5.7 contacts.proto File Reference

Variables

- message **Contacts**
- package gazebo **msgs**
- import **contact proto**
- required **Time time** = 2

5.7.1 Variable Documentation

5.7.1.1 message Contacts

Initial value:

```
{
  repeated Contact contact   = 1
```

5.7.1.2 package gazebo msgs

5.7.1.3 import time proto

5.7.1.4 required Time time = 2

5.8 contactsensor.proto File Reference

Variables

- message **ContactSensor**
- package gazebo **msgs**

5.8.1 Variable Documentation

5.8.1.1 message ContactSensor

Initial value:

```
{
  optional string collision_name = 1
```

5.8.1.2 package gazebo msgs

5.9 cylindergeom.proto File Reference

Variables

- message **CylinderGeom**
- required double **length** = 2
- package gazebo **msgs**

5.9.1 Variable Documentation

5.9.1.1 message CylinderGeom

Initial value:

```
{
  required double radius  = 1
```

5.9.1.2 required double length = 2

5.9.1.3 package gazebo msgs

5.10 diagnostics.proto File Reference

Variables

- message **Diagnostics**

- package gazebo **msgs**
- import **time proto**
- required **Time real_time** = 2
- required double **real_time_factor** = 4
- required **Time sim_time** = 3

5.10.1 Variable Documentation

5.10.1.1 message Diagnostics

Initial value:

```
{
  message DiagTime
  {
    required string name = 1;
    required Time elapsed = 2;
    required Time wall = 3;
  }

  repeated DiagTime time = 1
```

5.10.1.2 package gazebo msgs

5.10.1.3 import time proto

5.10.1.4 required Time real_time = 2

5.10.1.5 required double real_time_factor = 4

5.10.1.6 required Time sim_time = 3

5.11 factory.proto File Reference

Variables

- optional string **clone_model_name** = 5
- optional string **edit_name** = 4
- message **Factory**
- package gazebo **msgs**
- optional **Pose pose** = 3
- import header **proto**
- optional string **sdf_filename** = 2

5.11.1 Variable Documentation

5.11.1.1 optional string clone_model_name = 5

5.11.1.2 optional string edit_name = 4

5.11.1.3 message Factory

Initial value:

```
{
  optional string sdf                       = 1
```

5.11.1.4 package gazebo msgs

5.11.1.5 optional Pose pose = 3

5.11.1.6 import pose proto

5.11.1.7 optional string sdf_filename = 2

5.12 fog.proto File Reference

Variables

- optional **Color color** = 2
- optional float **density** = 3
- optional float **end** = 5
- message **Fog**
- package gazebo **msgs**
- import **color proto**
- optional float **start** = 4

5.12.1 Variable Documentation

5.12.1.1 optional Color color = 2

5.12.1.2 optional float density = 3

5.12.1.3 optional float end = 5

5.12.1.4 message Fog

Initial value:

```
{
  enum FogType
  {
    NONE         = 1;
    LINEAR       = 2;
    EXPONENTIAL  = 3;
    EXPONENTIAL2 = 4;
  }
  optional FogType type = 1
```

5.12.1.5 package gazebo msgs

5.12.1.6 import color proto

5.12.1.7 optional float start = 4

5.13 friction.proto File Reference

Variables

- optional **Vector3d fdir1** = 3
- message **Friction**
- package gazebo **msgs**
- optional double **mu2** = 2
- import vector3d **proto**
- optional double **slip1** = 4
- optional double **slip2** = 5

5.13.1 Variable Documentation

5.13.1.1 optional Vector3d fdir1 = 3

5.13.1.2 message Friction

Initial value:

```
{
  optional double   mu     = 1
```

5.13.1.3 package gazebo msgs

5.13.1.4 optional double mu2 = 2

5.13.1.5 import vector3d proto

5.13.1.6 optional double slip1 = 4

5.13.1.7 optional double slip2 = 5

5.14 geometry.proto File Reference

Variables

- optional **BoxGeom box** = 2
- optional **CylinderGeom cylinder** = 3
- message **Geometry**
- optional **HeightmapGeom heightmap** = 7
- optional **ImageGeom image** = 6
- optional **MeshGeom mesh** = 8
- package gazebo **msgs**
- optional **PlaneGeom plane** = 4
- repeated **Vector3d points** = 9
- import boxgeom **proto**
- optional **SphereGeom sphere** = 5

5.14.1 Variable Documentation

5.14.1.1 optional BoxGeom box = 2

5.14.1.2 optional CylinderGeom cylinder = 3

5.14.1.3 message Geometry

Initial value:

```
{
  enum Type
  {
    BOX          = 1;
    CYLINDER     = 2;
    SPHERE       = 3;
    PLANE        = 4;
    IMAGE        = 5;
    HEIGHTMAP    = 6;
    MESH         = 7;
    TRIANGLE_FAN = 8;
    LINE_STRIP   = 9;
    EMPTY        =10;
  }

  optional Type type               = 1
```

5.14.1.4 optional HeightmapGeom heightmap = 7

5.14.1.5 optional ImageGeom image = 6

5.14.1.6 optional MeshGeom mesh = 8

5.14.1.7 package gazebo msgs

5.14.1.8 optional PlaneGeom plane = 4

5.14.1.9 repeated Vector3d points = 9

5.14.1.10 import vector3d proto

5.14.1.11 optional SphereGeom sphere = 5

5.15 gui.proto File Reference

Variables

- optional **GUICamera camera** = 2
- message **GUI**
- package gazebo **msgs**
- import gui_camera **proto**

5.15.1 Variable Documentation

5.15.1.1 optional GUICamera camera = 2

5.15.1.2 message GUI

Initial value:

```
{
  optional bool fullscreen  = 1
```

5.15.1.3 package gazebo msgs

5.15.1.4 import gui_camera proto

5.16 gui_camera.proto File Reference

Variables

- message **GUICamera**
- package gazebo **msgs**
- optional **Pose pose** = 3
- import **pose proto**
- optional **TrackVisual track** = 4
- optional string **view_controller** = 2

5.16.1 Variable Documentation

5.16.1.1 message GUICamera

Initial value:

```
{
  required string name                  = 1
```

5.16.1.2 package gazebo msgs

5.16.1.3 optional Pose pose = 3

5.16.1.4 import track_visual proto

5.16.1.5 optional TrackVisual track = 4

5.16.1.6 optional string view_controller = 2

5.17 gui_overlay_config.proto File Reference

Variables

- message **GUIOverlayConfig**
- package gazebo **msgs**

5.17.1 Variable Documentation

5.17.1.1 message GUIOverlayConfig

Initial value:

```
{
  required string layout_filename = 1
```

5.17.1.2 package gazebo msgs

5.18 gz_string.proto File Reference

Variables

- message **GzString**
- package gazebo **msgs**

5.18.1 Variable Documentation

5.18.1.1 message GzString

Initial value:

```
{
  required string data = 1
```

5.18.1.2 package gazebo msgs

5.19 gz_string_v.proto File Reference

Variables

- message **GzString_V**
- package gazebo **msgs**

5.19.1 Variable Documentation

5.19.1.1 message GzString_V

Initial value:

```
{
  repeated string data = 1
```

5.19.1.2 package gazebo msgs

5.20 header.proto File Reference

Variables

- message **Header**
- optional int32 **index** = 3
- package gazebo **msgs**
- import **time proto**
- optional **Time stamp** = 2

5.20.1 Variable Documentation

5.20.1.1 message Header

Initial value:

```
{
  optional string str_id = 1
```

5.20.1.2 optional int32 index = 3

5.20.1.3 package gazebo msgs

5.20.1.4 import time proto

5.20.1.5 optional Time stamp = 2

5.21 heightmapgeom.proto File Reference

Variables

- message **Blend**
- repeated **Blend blend** = 8
- required double **fade_dist** = 2
- optional int32 **height** = 6
- message **HeightmapGeom**
- repeated float **heights** = 4
- package gazebo **msgs**
- required string **normal** = 2
- optional **Vector3d origin** = 3
- import **image proto**
- required **Vector3d size** = 2
- message **Texture**
- repeated **Texture texture** = 7
- optional int32 **width** = 5

5.21.1 Variable Documentation

5.21.1.1 message Blend

Initial value:

```
{
    required double min_height = 1
```

5.21.1.2 repeated Blend blend = 8

5.21.1.3 required double fade_dist = 2

5.21.1.4 optional int32 height = 6

5.21.1.5 message HeightmapGeom

Initial value:

```
{
  optional Image  image      = 1
```

5.21.1.6 repeated float heights = 4

5.21.1.7 package gazebo msgs

5.21.1.8 required string normal = 2

5.21.1.9 optional Vector3d origin = 3

5.21.1.10 import vector3d proto

5.21.1.11 required double size = 2

5.21.1.12 message Texture

Initial value:

```
{
    required string diffuse    = 1
```

5.21.1.13 repeated Texture texture = 7

5.21.1.14 optional int32 width = 5

5.22 image.proto File Reference

Variables

- required bytes **data** = 5

- required uint32 **height** = 2
- message **Image**
- package gazebo **msgs**
- required uint32 **pixel_format** = 3
- required uint32 **step** = 4

5.22.1 Variable Documentation

5.22.1.1 required bytes data = 5

5.22.1.2 required uint32 height = 2

5.22.1.3 message Image

Initial value:

```
{
  required uint32 width         = 1
```

5.22.1.4 package gazebo msgs

5.22.1.5 required uint32 pixel_format = 3

5.22.1.6 required uint32 step = 4

5.23 image_stamped.proto File Reference

Variables

- required **Image image** = 2
- message **ImageStamped**
- package gazebo **msgs**
- import **time proto**

5.23.1 Variable Documentation

5.23.1.1 required Image image = 2

5.23.1.2 message ImageStamped

Initial value:

```
{
  required Time time          = 1
```

5.23.1.3 package gazebo msgs

5.23.1.4 import image proto

5.24 imagegeom.proto File Reference

Variables

- optional int32 **granularity** = 5
- optional double **height** = 4
- message **ImageGeom**
- package gazebo **msgs**
- optional double **scale** = 2
- optional int32 **threshold** = 3 [default = 255]

5.24.1 Variable Documentation

5.24.1.1 optional int32 granularity = 5

5.24.1.2 optional double height = 4

5.24.1.3 message ImageGeom

Initial value:

```
{
  required string uri         = 1
```

5.24.1.4 package gazebo msgs

5.24.1.5 optional double scale = 2

5.24.1.6 optional int32 threshold = 3 [default = 255]

5.25 images_stamped.proto File Reference

Variables

- repeated **Image image** = 2
- message **ImagesStamped**
- package gazebo **msgs**
- import **time proto**

5.25.1 Variable Documentation

5.25.1.1 repeated Image image = 2

5.25.1.2 message ImagesStamped

Initial value:

```
{
  required Time time          = 1
```

5.25.1.3 package gazebo msgs

5.25.1.4 import image proto

5.26 imu.proto File Reference

Variables

- required **Vector3d angular_velocity** = 4
- required string **entity_name** = 2
- message **IMU**
- required **Vector3d linear_acceleration** = 5
- package gazebo **msgs**
- required **Quaternion orientation** = 3
- import **time proto**

5.26.1 Variable Documentation

5.26.1.1 required Vector3d angular_velocity = 4

5.26.1.2 required string entity_name = 2

5.26.1.3 message IMU

Initial value:

```
{
  required Time stamp                   = 1
```

5.26.1.4 required Vector3d linear_acceleration = 5

5.26.1.5 package gazebo msgs

5.26.1.6 required Quaternion orientation = 3

5.26.1.7 import quaternion proto

5.27 inertial.proto File Reference

Variables

- message **Inertial**

- optional double **ixx** = 3
- optional double **ixy** = 4
- optional double **ixz** = 5
- optional double **iyy** = 6
- optional double **iyz** = 7
- optional double **izz** = 8
- package gazebo **msgs**
- optional **Pose pose** = 2
- import **pose proto**

5.27.1 Variable Documentation

5.27.1.1 message Inertial

Initial value:

```
{
  optional double mass             = 1
```

5.27.1.2 optional double ixx = 3

5.27.1.3 optional double ixy = 4

5.27.1.4 optional double ixz = 5

5.27.1.5 optional double iyy = 6

5.27.1.6 optional double iyz = 7

5.27.1.7 optional double izz = 8

5.27.1.8 package gazebo msgs

5.27.1.9 optional Pose pose = 2

5.27.1.10 import pose proto

5.28 int.proto File Reference

Variables

- message **Int**
- package gazebo **msgs**

5.28.1 Variable Documentation

5.28.1.1 message Int

Initial value:

```
{
  required int32 data = 1
```

5.28.1.2 package gazebo msgs

5.29 joint.proto File Reference

Variables

- repeated double **angle** = 2
- optional **Axis axis1** = 7
- optional **Axis axis2** = 8
- optional double **bounce** = 10
- optional double **cfm** = 9
- optional string **child** = 5
- optional double **fudge_factor** = 12
- message **Joint**
- optional double **limit_cfm** = 13
- optional double **limit_erp** = 14
- package gazebo **msgs**
- optional string **parent** = 4
- optional **Pose pose** = 6
- import vector3d **proto**
- repeated **Sensor sensor** = 17
- optional double **suspension_cfm** = 15
- optional double **suspension_erp** = 16
- optional Type **type** = 3
- optional double **velocity** = 11

5.29.1 Variable Documentation

5.29.1.1 repeated double angle = 2

5.29.1.2 optional Axis axis1 = 7

5.29.1.3 optional Axis axis2 = 8

5.29.1.4 optional double bounce = 10

5.29.1.5 optional double cfm = 9

5.29.1.6 optional string child = 5

5.29.1.7 optional double fudge_factor = 12

5.29.1.8 message Joint

Initial value:

```
{
  enum Type
  {
    REVOLUTE  = 1;
    REVOLUTE2 = 2;
    PRISMATIC = 3;
    UNIVERSAL = 4;
    BALL      = 5;
    SCREW     = 6;
  }

  required string name           = 1
```

5.29.1.9 optional double limit_cfm = 13

5.29.1.10 optional double limit_erp = 14

5.29.1.11 package gazebo msgs

5.29.1.12 optional string parent = 4

5.29.1.13 optional Pose pose = 6

5.29.1.14 import sensor proto

5.29.1.15 repeated Sensor sensor = 17

5.29.1.16 optional double suspension_cfm = 15

5.29.1.17 optional double suspension_erp = 16

5.29.1.18 optional Type type = 3

5.29.1.19 optional double velocity = 11

5.30 joint_animation.proto File Reference

Variables

- repeated **Joint joint** = 2
- message **JointAnimation**
- package gazebo **msgs**
- import **pose proto**
- repeated **Time time** = 3

5.30.1 Variable Documentation

5.30.1.1 repeated Joint joint = 2

5.30.1.2 message JointAnimation

Initial value:

```
{
  message Joint
  {
    repeated string name  = 1;
    repeated double angle = 2;
  }

  required string model_name   = 1
```

5.30.1.3 package gazebo msgs

5.30.1.4 import time proto

5.30.1.5 repeated Time time = 3

5.31 joint_cmd.proto File Reference

Variables

- optional int32 **axis** = 2 [default=0]
- optional double **force** = 3
- message **JointCmd**
- package gazebo **msgs**
- optional **PID position** = 4
- import vector3d **proto**
- optional bool **reset** = 6
- optional **PID velocity** = 5

5.31.1 Variable Documentation

5.31.1.1 optional int32 axis = 2 [default=0]

5.31.1.2 optional double force = 3

5.31.1.3 message JointCmd

Initial value:

```
{
  required string name     = 1
```

5.31.1.4 package gazebo msgs

5.31.1.5 optional PID position = 4

5.31.1.6 import pid proto

5.31.1.7 optional bool reset = 6

5.31.1.8 optional PID velocity = 5

5.32 joint_wrench.proto File Reference

Variables

- required uint32 **body_1_id** = 2
- required **Wrench body_1_wrench** = 5
- required uint32 **body_2_id** = 4
- required string **body_2_name** = 3
- required **Wrench body_2_wrench** = 6
- message **JointWrench**
- package gazebo **msgs**
- import **wrench proto**

5.32.1 Variable Documentation

5.32.1.1 required uint32 body_1_id = 2

5.32.1.2 required Wrench body_1_wrench = 5

5.32.1.3 required uint32 body_2_id = 4

5.32.1.4 required string body_2_name = 3

5.32.1.5 required Wrench body_2_wrench = 6

5.32.1.6 message JointWrench

Initial value:

```
{
  required string body_1_name = 1
```

5.32.1.7 package gazebo msgs

5.32.1.8 import wrench proto

5.33 joint_wrench_stamped.proto File Reference

Variables

- message **ForceTorque**
- package gazebo **msgs**
- import joint_wrench **proto**
- required **Time time** = 2

5.33.1 Variable Documentation

5.33.1.1 message ForceTorque

Initial value:

```
{
  repeated JointWrench wrench = 1
```

5.33.1.2 package gazebo msgs

5.33.1.3 import time proto

5.33.1.4 required Time time = 2

5.34 laserscan.proto File Reference

Variables

- required double **angle_max** = 4
- required double **angle_min** = 3
- required double **angle_step** = 5
- repeated double **intensities** = 9
- message **LaserScan**
- package gazebo **msgs**
- import **pose proto**
- required double **range_max** = 7
- required double **range_min** = 6
- repeated double **ranges** = 8
- required **Pose world_pose** = 2

5.34.1 Variable Documentation

5.34.1.1 required double angle_max = 4

5.34.1.2 required double angle_min = 3

5.34.1.3 required double angle_step = 5

5.34.1.4 repeated double intensities = 9

5.34.1.5 message LaserScan

Initial value:

```
{
  required string frame       = 1
```

5.34.1.6 package gazebo msgs

5.34.1.7 import pose proto

5.34.1.8 required double range_max = 7

5.34.1.9 required double range_min = 6

5.34.1.10 repeated double ranges = 8

5.34.1.11 required Pose world_pose = 2

5.35 laserscan_stamped.proto File Reference

Variables

- message **LaserScanStamped**
- package gazebo **msgs**
- import **time proto**
- required **LaserScan scan** = 2

5.35.1 Variable Documentation

5.35.1.1 message LaserScanStamped

Initial value:

```
{
  required Time time          = 1
```

5.35.1.2 package gazebo msgs

5.35.1.3 import laserscan proto

5.35.1.4 required LaserScan scan = 2

5.36 light.proto File Reference

Enumerations

- enum **LightType** { **DIRECTIONAL** = 3 }

Variables

- optional float **attenuation_constant** = 6
- optional float **attenuation_linear** = 7
- optional float **attenuation_quadratic** = 8
- optional bool **cast_shadows** = 11

- optional **Color diffuse** = 4
- optional **Vector3d direction** = 9
- message **Light**
- package gazebo **msgs**
- optional **Pose pose** = 3
- import header **proto**
- optional float **range** = 10
- optional **Color specular** = 5
- optional float **spot_falloff** = 14
- optional float **spot_inner_angle** = 12
- optional float **spot_outer_angle** = 13
- enum **LightType type** = 2

5.36.1 Enumeration Type Documentation

5.36.1.1 enum LightType

Enumerator:

DIRECTIONAL

5.36.2 Variable Documentation

5.36.2.1 optional float attenuation_constant = 6

5.36.2.2 optional float attenuation_linear = 7

5.36.2.3 optional float attenuation_quadratic = 8

5.36.2.4 optional bool cast_shadows = 11

5.36.2.5 optional Color diffuse = 4

5.36.2.6 optional Vector3d direction = 9

5.36.2.7 message Light

Initial value:

```
{
  required string name                   = 1
```

5.36.2.8 package gazebo msgs

5.36.2.9 optional Pose pose = 3

5.36.2.10 import color proto

5.36.2.11 optional float range = 10

5.36.2.12 optional Color specular = 5

5.36.2.13 optional float spot_falloff = 14

5.36.2.14 optional float spot_inner_angle = 12

5.36.2.15 optional float spot_outer_angle = 13

5.36.2.16 enum LightType type = 2

5.37 link.proto File Reference

Variables

- repeated **Collision collision** = 10
- optional bool **enabled** = 6
- optional bool **gravity** = 4
- optional **Inertial inertial** = 7
- optional bool **kinematic** = 5
- message **Link**
- package gazebo **msgs**
- required string **name** = 2
- optional **Pose pose** = 8
- repeated **Projector projector** = 12
- import header **proto**
- optional bool **self_collide** = 3
- repeated **Sensor sensor** = 11
- repeated **Visual visual** = 9

5.37.1 Variable Documentation

5.37.1.1 repeated Collision collision = 10

5.37.1.2 optional bool enabled = 6

5.37.1.3 optional bool gravity = 4

5.37.1.4 optional Inertial inertial = 7

5.37.1.5 optional bool kinematic = 5

5.37.1.6 message Link

Initial value:

```
{
  required uint32 id            = 1
```

5.37.1.7 package gazebo msgs

5.37.1.8 required string name = 2

5.37.1.9 optional Pose pose = 8

5.37.1.10 repeated Projector projector = 12

5.37.1.11 import pose proto

5.37.1.12 optional bool self_collide = 3

5.37.1.13 repeated Sensor sensor = 11

5.37.1.14 repeated Visual visual = 9

5.38 link_data.proto File Reference

Variables

- optional **Vector3d angular_velocity** = 4
- optional **Vector3d linear_velocity** = 3
- message **LinkData**
- package gazebo **msgs**
- required string **name** = 2
- import vector3d **proto**

5.38.1 Variable Documentation

5.38.1.1 optional Vector3d angular_velocity = 4

5.38.1.2 optional Vector3d linear_velocity = 3

5.38.1.3 message LinkData

Initial value:

```
{
  required Time time              = 1
```

5.38.1.4 package gazebo msgs

5.38.1.5 required string name = 2

5.38.1.6 import time proto

5.39 log_control.proto File Reference

Variables

- optional string **base_path** = 4
- optional string **encoding** = 5
- message **LogControl**
- package gazebo **msgs**
- optional bool **paused** = 3
- optional bool **stop** = 2

5.39.1 Variable Documentation

5.39.1.1 optional string base_path = 4

5.39.1.2 optional string encoding = 5

5.39.1.3 message LogControl

Initial value:

```
{
  optional bool start           = 1
```

5.39.1.4 package gazebo msgs

5.39.1.5 optional bool paused = 3

5.39.1.6 optional bool stop = 2

5.40 log_status.proto File Reference

Variables

- optional LogFile **log_file** = 2
- message **LogStatus**
- package gazebo **msgs**
- import **time proto**

5.40.1 Variable Documentation

5.40.1.1 optional LogFile log_file = 2

5.40.1.2 message LogStatus

Initial value:

```
{
  message LogFile
  {
    enum Units
    {
      BYTES = 1;
```

```
      K_BYTES = 2;
      M_BYTES = 3;
      G_BYTES = 4;
    }

    optional string uri        = 1;
    optional string base_path  = 2;
    optional string full_path  = 3;
    optional float size        = 4;
    optional Units size_units  = 5;
  }

  optional Time sim_time     = 1
```

5.40.1.3 package gazebo msgs

5.40.1.4 import time proto

5.41 mainpage_msgs.html File Reference

5.42 material.proto File Reference

Variables

- optional **Color ambient** = 4
- optional **Color diffuse** = 5
- optional **Color emissive** = 7
- message **Material**
- package gazebo **msgs**
- optional string **normal_map** = 3
- import **color proto**
- optional ShaderType **shader_type** = 2
- optional **Color specular** = 6

5.42.1 Variable Documentation

5.42.1.1 optional Color ambient = 4

5.42.1.2 optional Color diffuse = 5

5.42.1.3 optional Color emissive = 7

5.42.1.4 message Material

Initial value:

```
{
  enum ShaderType
  {
    VERTEX                  = 1;
    PIXEL                   = 2;
    NORMAL_MAP_OBJECT_SPACE = 3;
    NORMAL_MAP_TANGENT_SPACE = 4;
  }

  message Script
```

```
{
  repeated string uri = 1;
  required string name = 2;
}

optional Script script          = 1
```

5.42.1.5 package gazebo msgs

5.42.1.6 optional string normal_map = 3

5.42.1.7 import color proto

5.42.1.8 optional ShaderType shader_type = 2

5.42.1.9 optional Color specular = 6

5.43 meshgeom.proto File Reference

Variables

- optional bool **center_submesh** = 4
- message **MeshGeom**
- package gazebo **msgs**
- import vector3d **proto**
- optional **Vector3d scale** = 2
- optional string **submesh** = 3

5.43.1 Variable Documentation

5.43.1.1 optional bool center_submesh = 4

5.43.1.2 message MeshGeom

Initial value:

```
{
  required string filename = 1
```

5.43.1.3 package gazebo msgs

5.43.1.4 import vector3d proto

5.43.1.5 optional Vector3d scale = 2

5.43.1.6 optional string submesh = 3

5.44 model.proto File Reference

Variables

- optional bool **deleted** = 7
- optional uint32 **id** = 2
- optional bool **is_static** = 3
- repeated **Joint joint** = 5
- repeated **Link link** = 6
- message **Model**
- package gazebo **msgs**
- optional **Pose pose** = 4
- import **joint proto**
- repeated **Visual visual** = 8

5.44.1 Variable Documentation

5.44.1.1 optional bool deleted = 7

5.44.1.2 optional uint32 id = 2

5.44.1.3 optional bool is_static = 3

5.44.1.4 repeated Joint joint = 5

5.44.1.5 repeated Link link = 6

5.44.1.6 message Model

Initial value:

```
{
  required string name         = 1
```

5.44.1.7 package gazebo msgs

5.44.1.8 optional Pose pose = 4

5.44.1.9 import visual proto

5.44.1.10 repeated Visual visual = 8

5.45 model_configuration.proto File Reference

Variables

- repeated string **joint_names** = 2
- repeated double **joint_positions** = 3
- optional string **link_name** = 5
- message **ModelConfiguration**
- package gazebo **msgs**
- optional **Pose pose** = 4
- import **time proto**

5.45.1 Variable Documentation

5.45.1.1 repeated string joint_names = 2

5.45.1.2 repeated double joint_positions = 3

5.45.1.3 optional string link_name = 5

5.45.1.4 message ModelConfiguration

Initial value:

```
{
  required Time time                          = 1
```

5.45.1.5 package gazebo msgs

5.45.1.6 optional Pose pose = 4

5.45.1.7 import pose proto

5.46 model_v.proto File Reference

Variables

- message **Model_V**
- package gazebo **msgs**
- import **model proto**

5.46.1 Variable Documentation

5.46.1.1 message Model_V

Initial value:

```
{
  repeated Model models  = 2
```

5.46.1.2 package gazebo msgs

5.46.1.3 import model proto

5.47 packet.proto File Reference

Variables

- package gazebo **msgs**
- message **Packet**

- import **time proto**
- required bytes **serialized_data** = 3
- required string **type** = 2

5.47.1 Variable Documentation

5.47.1.1 package gazebo msgs

5.47.1.2 message Packet

Initial value:

```
{
  required Time stamp            = 1
```

5.47.1.3 import time proto

5.47.1.4 required bytes serialized_data = 3

5.47.1.5 required string type = 2

5.48 physics.proto File Reference

Variables

- optional double **cfm** = 9
- optional double **contact_max_correcting_vel** = 11
- optional double **contact_surface_layer** = 12
- optional double **dt** = 4

  dt is deprecated by max_step_size
- optional bool **enable_physics** = 15
- optional double **erp** = 10
- optional **Vector3d gravity** = 13
- optional int32 **iters** = 7
- optional double **max_step_size** = 18
- optional double **min_step_size** = 5
- package gazebo **msgs**
- message **Physics**
- optional int32 **precon_iters** = 6
- import vector3d **proto**
- optional double **real_time_factor** = 16
- optional double **real_time_update_rate** = 17
- optional string **solver_type** = 3
- optional double **sor** = 8
- optional double **update_rate** = 14

  update_rate is deprecated by real_time_update_rate

5.48.1 Variable Documentation

5.48.1.1 optional double cfm = 9

5.48.1.2 optional double contact_max_correcting_vel = 11

5.48.1.3 optional double contact_surface_layer = 12

5.48.1.4 optional double dt = 4

dt is deprecated by max_step_size

5.48.1.5 optional bool enable_physics = 15

5.48.1.6 optional double erp = 10

5.48.1.7 optional Vector3d gravity = 13

5.48.1.8 optional int32 iters = 7

5.48.1.9 optional double max_step_size = 18

5.48.1.10 optional double min_step_size = 5

5.48.1.11 package gazebo msgs

5.48.1.12 message Physics

Initial value:

```
{
  enum Type
  {
    ODE = 1;
    BULLET = 2;
  }
  required Type type = 2[default=ODE]
```

5.48.1.13 optional int32 precon_iters = 6

5.48.1.14 import header proto

5.48.1.15 optional double real_time_factor = 16

5.48.1.16 optional double real_time_update_rate = 17

5.48.1.17 optional string solver_type = 3

5.48.1.18 optional double sor = 8

5.48.1.19 optional double update_rate = 14

update_rate is deprecated by real_time_update_rate

5.49 pid.proto File Reference

Variables

- optional double **d_gain** = 4[default=0.0]
- optional double **i_gain** = 3[default=0.0]
- optional double **i_max** = 5[default=0.0]
- optional double **i_min** = 6[default=0.0]
- optional double **limit** = 7[default=0.0]
- package gazebo **msgs**
- optional double **p_gain** = 2[default=0.0]
- message **PID**

5.49.1 Variable Documentation

5.49.1.1 optional double d_gain = 4[default=0.0]

5.49.1.2 optional double i_gain = 3[default=0.0]

5.49.1.3 optional double i_max = 5[default=0.0]

5.49.1.4 optional double i_min = 6[default=0.0]

5.49.1.5 optional double limit = 7[default=0.0]

5.49.1.6 package gazebo msgs

5.49.1.7 optional double p_gain = 2[default=0.0]

5.49.1.8 message PID

Initial value:

```
{
  optional double target = 1[default=0.0]
```

5.50 planegeom.proto File Reference

Variables

- optional double **d** = 3 [default = 0]
- package gazebo **msgs**
- message **PlaneGeom**
- import vector3d **proto**
- required **Vector2d size** = 2

5.50.1 Variable Documentation

5.50.1.1 optional double d = 3 [default = 0]

5.50.1.2 package gazebo msgs

5.50.1.3 message PlaneGeom

Initial value:

```
{
  required Vector3d normal  = 1
```

5.50.1.4 import vector2d proto

5.50.1.5 required Vector2d size = 2

5.51 plugin.proto File Reference

Variables

- required string **filename** = 2
- optional string **innerxml** = 3 [default = ""]
- package gazebo **msgs**
- message **Plugin**

5.51.1 Variable Documentation

5.51.1.1 required string filename = 2

5.51.1.2 optional string innerxml = 3 [default = ""]

5.51.1.3 package gazebo msgs

5.51.1.4 message Plugin

Initial value:

```
{
  required string name         = 1
```

5.52 pointcloud.proto File Reference

Variables

- package gazebo **msgs**
- message **PointCloud**
- import vector3d **proto**

5.52.1 Variable Documentation

5.52.1.1 package gazebo msgs

5.52.1.2 message PointCloud

Initial value:

```
{
  repeated Vector3d points = 1
```

5.52.1.3 import vector3d proto

5.53 pose.proto File Reference

Variables

- package gazebo **msgs**
- required **Quaternion orientation** = 3
- message **Pose**
- required **Vector3d position** = 2
- import vector3d **proto**

5.53.1 Variable Documentation

5.53.1.1 package gazebo msgs

5.53.1.2 required Quaternion orientation = 3

5.53.1.3 message Pose

Initial value:

```
{
  optional string name            = 1
```

5.53.1.4 required Vector3d position = 2

5.53.1.5 import quaternion proto

5.54 pose_animation.proto File Reference

Variables

- package gazebo **msgs**
- repeated **Pose pose** = 2
- message **PoseAnimation**
- import **pose proto**
- repeated **Time time** = 3

5.54.1 Variable Documentation

5.54.1.1 package gazebo msgs

5.54.1.2 repeated Pose pose = 2

5.54.1.3 message PoseAnimation

Initial value:

```
{
  required string model_name      = 1
```

5.54.1.4 import time proto

5.54.1.5 repeated Time time = 3

5.55 pose_stamped.proto File Reference

Variables

- package gazebo **msgs**
- required **Pose pose** = 2
- message **PoseStamped**
- import **time proto**

5.55.1 Variable Documentation

5.55.1.1 package gazebo msgs

5.55.1.2 required Pose pose = 2

5.55.1.3 message PoseStamped

Initial value:

```
{
  required Time time          = 1
```

5.55.1.4 import pose proto

5.56 pose_trajectory.proto File Reference

Variables

- optional uint32 **id** = 2
- package gazebo **msgs**
- repeated **PoseStamped pose_stamped** = 3
- message **PoseTrajectory**
- import **pose_stamped proto**

5.56.1 Variable Documentation

5.56.1.1 optional uint32 id = 2

5.56.1.2 package gazebo msgs

5.56.1.3 repeated PoseStamped pose_stamped = 3

5.56.1.4 message PoseTrajectory

Initial value:

```
{
  optional string name              = 1
```

5.56.1.5 import pose_stamped proto

5.57 pose_v.proto File Reference

Variables

- package gazebo **msgs**
- message **Pose_V**
- import **pose proto**

5.57.1 Variable Documentation

5.57.1.1 package gazebo msgs

5.57.1.2 message Pose_V

Initial value:

```
{
  repeated Pose pose = 1
```

5.57.1.3 import pose proto

5.58 poses_stamped.proto File Reference

Variables

- package gazebo **msgs**
- repeated **Pose pose** = 2
- message **PosesStamped**
- import **time proto**

5.58.1 Variable Documentation

5.58.1.1 package gazebo msgs

5.58.1.2 repeated Pose pose = 2

5.58.1.3 message PosesStamped

Initial value:

```
{
  required Time time = 1
```

5.58.1.4 import pose proto

5.59 projector.proto File Reference

Variables

- optional bool **enabled** = 7[default=true]
- optional double **far_clip** = 6[default=10.0]
- optional double **fov** = 4[default=0.785]
- package gazebo **msgs**
- optional double **near_clip** = 5[default=0.1]
- optional **Pose pose** = 3
- message **Projector**
- import **pose proto**
- optional string **texture** = 2

5.59.1 Variable Documentation

5.59.1.1 optional bool enabled = 7[default=true]

5.59.1.2 optional double far_clip = 6[default=10.0]

5.59.1.3 optional double fov = 4[default=0.785]

5.59.1.4 package gazebo msgs

5.59.1.5 optional double near_clip = 5[default=0.1]

5.59.1.6 optional Pose pose = 3

5.59.1.7 message Projector

Initial value:

```
{
  required string name          = 1
```

5.59.1.8 import pose proto

5.59.1.9 optional string texture = 2

5.60 publish.proto File Reference

Variables

- required string **host** = 3
- required string **msg_type** = 2
- package gazebo **msgs**
- required uint32 **port** = 4
- message **Publish**

5.60.1 Variable Documentation

5.60.1.1 required string host = 3

5.60.1.2 required string msg_type = 2

5.60.1.3 package gazebo msgs

5.60.1.4 required uint32 port = 4

5.60.1.5 message Publish

Initial value:

```
{
  required string topic    = 1
```

5.61 publishers.proto File Reference

Variables

- package gazebo **msgs**
- import publish **proto**
- message **Publishers**

5.61.1 Variable Documentation

5.61.1.1 package gazebo msgs

5.61.1.2 import publish proto

5.61.1.3 message Publishers

Initial value:

```
{
  repeated Publish publisher = 1
```

5.62 quaternion.proto File Reference

Variables

- package gazebo **msgs**
- message **Quaternion**
- required double **w** = 5
- required double **y** = 3
- required double **z** = 4

5.62.1 Variable Documentation

5.62.1.1 package gazebo msgs

5.62.1.2 message Quaternion

Initial value:

```
{
  required double x = 2
```

5.62.1.3 required double w = 5

5.62.1.4 required double y = 3

5.62.1.5 required double z = 4

5.63 raysensor.proto File Reference

Variables

- optional double **horizontal_max_angle** = 5
- optional double **horizontal_min_angle** = 4
- optional double **horizontal_resolution** = 3
- optional int32 **horizontal_samples** = 2
- package gazebo **msgs**
- optional double **range_max** = 11
- optional double **range_min** = 10
- optional double **range_resolution** = 12
- message **RaySensor**
- optional double **vertical_max_angle** = 9
- optional double **vertical_min_angle** = 8
- optional double **vertical_resolution** = 7
- optional int32 **vertical_samples** = 6

5.63.1 Variable Documentation

5.63.1.1 optional double horizontal_max_angle = 5

5.63.1.2 optional double horizontal_min_angle = 4

5.63.1.3 optional double horizontal_resolution = 3

5.63.1.4 optional int32 horizontal_samples = 2

5.63.1.5 package gazebo msgs

5.63.1.6 optional double range_max = 11

5.63.1.7 optional double range_min = 10

5.63.1.8 optional double range_resolution = 12

5.63.1.9 message RaySensor

Initial value:

```
{
  optional bool display_scan            = 1
```

5.63.1.10 optional double vertical_max_angle = 9

5.63.1.11 optional double vertical_min_angle = 8

5.63.1.12 optional double vertical_resolution = 7

5.63.1.13 optional int32 vertical_samples = 6

5.64 request.proto File Reference

Variables

- optional string **data** = 3
- optional double **dbl_data** = 4
- package gazebo **msgs**
- message **Request**
- required string **request** = 2

5.64.1 Variable Documentation

5.64.1.1 optional string data = 3

5.64.1.2 optional double dbl_data = 4

5.64.1.3 package gazebo msgs

5.64.1.4 message Request

Initial value:

```
{
  required int32 id         = 1
```

5.64.1.5 required string request = 2

5.65 response.proto File Reference

Variables

- package gazebo **msgs**
- required string **request** = 2
- message **Response**
- required string **response** = 3
- optional bytes **serialized_data** = 5
- optional string **type** = 4

5.65.1 Variable Documentation

5.65.1.1 package gazebo msgs

5.65.1.2 required string request = 2

5.65.1.3 message Response

Initial value:

```
{
  required int32 id              = 1
```

5.65.1.4 required string response = 3

5.65.1.5 optional bytes serialized_data = 5

5.65.1.6 optional string type = 4

5.66 road.proto File Reference

Variables

- package gazebo **msgs**
- repeated **Vector3d point** = 3
- import vector3d **proto**
- message **Road**
- required double **width** = 2

5.66.1 Variable Documentation

5.66.1.1 package gazebo msgs

5.66.1.2 repeated Vector3d point = 3

5.66.1.3 import vector3d proto

5.66.1.4 message Road

Initial value:

```
{
  required string name      = 1
```

5.66.1.5 required double width = 2

5.67 scene.proto File Reference

Variables

- optional **Color ambient** = 2
- optional **Color background** = 3
- optional **Fog fog** = 6
- optional bool **grid** = 7
- repeated **Joint joint** = 10
- repeated **Light light** = 9
- repeated **Model model** = 8
- package gazebo **msgs**
- import header **proto**
- message **Scene**
- optional bool **shadows** = 5 [default = true]
- optional **Sky sky** = 4

5.67.1 Variable Documentation

5.67.1.1 optional Color ambient = 2

5.67.1.2 optional Color background = 3

5.67.1.3 optional Fog fog = 6

5.67.1.4 optional bool grid = 7

5.67.1.5 repeated Joint joint = 10

5.67.1.6 repeated Light light = 9

5.67.1.7 repeated Model model = 8

5.67.1.8 package gazebo msgs

5.67.1.9 import model proto

5.67.1.10 message Scene

Initial value:

```
{
  required string name         = 1
```

5.67.1.11 optional bool shadows = 5 [default = true]

5.67.1.12 optional Sky sky = 4

5.68 selection.proto File Reference

Variables

- package gazebo **msgs**
- required string **name** = 2
- import header **proto**
- optional bool **selected** = 3 [default = false]
- message **Selection**

5.68.1 Variable Documentation

5.68.1.1 package gazebo msgs

5.68.1.2 required string name = 2

5.68.1.3 import header proto

5.68.1.4 optional bool selected = 3 [default = false]

5.68.1.5 message Selection

Initial value:

```
{
  required uint32 id     = 1
```

5.69 sensor.proto File Reference

Variables

- optional bool **always_on** = 4
- optional **CameraSensor camera** = 7
- optional **ContactSensor contact** = 9

- package gazebo **msgs**
- required string **parent** = 2
- optional **Pose pose** = 6
- import **pose proto**
- optional **RaySensor ray** = 8
- message **Sensor**
- optional string **topic** = 11
- required string **type** = 3
- optional double **update_rate** = 5
- optional bool **visualize** = 10

5.69.1 Variable Documentation

5.69.1.1 optional bool always_on = 4

5.69.1.2 optional CameraSensor camera = 7

5.69.1.3 optional ContactSensor contact = 9

5.69.1.4 package gazebo msgs

5.69.1.5 required string parent = 2

5.69.1.6 optional Pose pose = 6

5.69.1.7 import contactsensor proto

5.69.1.8 optional RaySensor ray = 8

5.69.1.9 message Sensor

Initial value:

```
{
  required string name             = 1
```

5.69.1.10 optional string topic = 11

5.69.1.11 required string type = 3

5.69.1.12 optional double update_rate = 5

5.69.1.13 optional bool visualize = 10

5.70 server_control.proto File Reference

Variables

- package gazebo **msgs**
- optional bool **new_world** = 4

- optional string **open_filename** = 3
- import header **proto**
- optional string **save_filename** = 2
- message **ServerControl**

5.70.1 Variable Documentation

5.70.1.1 package gazebo msgs

5.70.1.2 optional bool new_world = 4

5.70.1.3 optional string open_filename = 3

5.70.1.4 import header proto

5.70.1.5 optional string save_filename = 2

5.70.1.6 message ServerControl

Initial value:

```
{
  optional string save_world_name = 1
```

5.71 shadows.proto File Reference

Variables

- optional **Color color** = 6
- package gazebo **msgs**
- import **color proto**
- message **Shadows**

5.71.1 Variable Documentation

5.71.1.1 optional Color color = 6

5.71.1.2 package gazebo msgs

5.71.1.3 import color proto

5.71.1.4 message Shadows

Initial value:

```
{
  enum ShadowType
  {
    STENCIL_ADDITIVE   = 1;
    STENCIL_MODULATIVE = 2;
    TEXTURE_ADDITIVE   = 3;
    TEXTURE_MODULATIVE = 4;
  }
  optional ShadowType type = 5
```

5.72 sky.proto File Reference

Variables

- optional **Color cloud_ambient** = 6
- optional double **humidity** = 7
- optional double **mean_cloud_size** = 8
- package gazebo **msgs**
- import **color proto**
- message **Sky**
- optional double **sunrise** = 2
- optional double **sunset** = 3
- optional double **wind_direction** = 5
- optional double **wind_speed** = 4

5.72.1 Variable Documentation

5.72.1.1 optional Color cloud_ambient = 6

5.72.1.2 optional double humidity = 7

5.72.1.3 optional double mean_cloud_size = 8

5.72.1.4 package gazebo msgs

5.72.1.5 import color proto

5.72.1.6 message Sky

Initial value:

```
{
  optional double time           = 1
```

5.72.1.7 optional double sunrise = 2

5.72.1.8 optional double sunset = 3

5.72.1.9 optional double wind_direction = 5

5.72.1.10 optional double wind_speed = 4

5.73 sonar.proto File Reference

Variables

- optional **Vector3d contact** = 7

  Location of the contact in the world frame.
- package gazebo **msgs**

- import **pose proto**
- required double **radius** = 5
- required double **range** = 6
- required double **range_max** = 4
- required double **range_min** = 3
- message **Sonar**
- required **Pose world_pose** = 2

5.73.1 Variable Documentation

5.73.1.1 optional Vector3d contact = 7

Location of the contact in the world frame.

5.73.1.2 package gazebo msgs

5.73.1.3 import vector3d proto

5.73.1.4 required double radius = 5

5.73.1.5 required double range = 6

5.73.1.6 required double range_max = 4

5.73.1.7 required double range_min = 3

5.73.1.8 message Sonar

Initial value:

```
{
  required string frame     = 1
```

5.73.1.9 required Pose world_pose = 2

5.74 sonar_stamped.proto File Reference

Variables

- package gazebo **msgs**
- import **time proto**
- required **Sonar sonar** = 2
- message **SonarStamped**

5.74.1 Variable Documentation

5.74.1.1 package gazebo msgs

5.74.1.2 import sonar proto

5.74.1.3 required Sonar sonar = 2

5.74.1.4 message SonarStamped

Initial value:

```
{
  required Time time       = 1
```

5.75 spheregeom.proto File Reference

Variables

- package gazebo **msgs**
- message **SphereGeom**

5.75.1 Variable Documentation

5.75.1.1 package gazebo msgs

5.75.1.2 message SphereGeom

Initial value:

```
{
  required double radius  = 1
```

5.76 subscribe.proto File Reference

Variables

- required string **host** = 2
- optional bool **latching** = 5 [default=false]
- required string **msg_type** = 4
- package gazebo **msgs**
- required uint32 **port** = 3
- message **Subscribe**

5.76.1 Variable Documentation

5.76.1.1 required string host = 2

5.76.1.2 optional bool latching = 5 [default=false]

5.76.1.3 required string msg_type = 4

5.76.1.4 package gazebo msgs

5.76.1.5 required uint32 port = 3

5.76.1.6 message Subscribe

Initial value:

```
{
  required string topic    = 1
```

5.77 surface.proto File Reference

Variables

- optional double **bounce_threshold** = 3
- optional bool **collide_without_contact** = 10
- optional uint32 **collide_without_contact_bitmask** = 11
- optional double **kd** = 7
- optional double **kp** = 6
- optional double **max_vel** = 8
- optional double **min_depth** = 9
- package gazebo **msgs**
- import **friction proto**
- optional double **restitution_coefficient** = 2
- optional double **soft_cfm** = 4
- optional double **soft_erp** = 5
- message **Surface**

5.77.1 Variable Documentation

5.77.1.1 optional double bounce_threshold = 3

5.77.1.2 optional bool collide_without_contact = 10

5.77.1.3 optional uint32 collide_without_contact_bitmask = 11

5.77.1.4 optional double kd = 7

5.77.1.5 optional double kp = 6

5.77.1.6 optional double max_vel = 8

5.77.1.7 optional double min_depth = 9

5.77.1.8 package gazebo msgs

5.77.1.9 import friction proto

5.77.1.10 optional double restitution_coefficient = 2

5.77.1.11 optional double soft_cfm = 4

5.77.1.12 optional double soft_erp = 5

5.77.1.13 message Surface

Initial value:

```
{
  optional Friction friction                = 1
```

5.78 tactile.proto File Reference

Variables

- repeated uint32 **collision_id** = 2
- package gazebo **msgs**
- repeated double **pressure** = 3
- import **time proto**
- message **Tactile**
- required **Time time** = 4

5.78.1 Variable Documentation

5.78.1.1 repeated uint32 collision_id = 2

5.78.1.2 package gazebo msgs

5.78.1.3 repeated double pressure = 3

5.78.1.4 import time proto

5.78.1.5 message Tactile

Initial value:

```
{
  repeated string collision_name = 1
```

5.78.1.6 required Time time = 4

5.79 test.proto File Reference

Variables

- package gazebo **msgs**

- import header **proto**
- message **Test**

5.79.1 Variable Documentation

5.79.1.1 package gazebo msgs

5.79.1.2 import header proto

5.79.1.3 message Test

Initial value:

```
{
  required Header header = 1
```

5.80 time.proto File Reference

Variables

- package gazebo **msgs**
- required int32 **nsec** = 2
- message **Time**

5.80.1 Variable Documentation

5.80.1.1 package gazebo msgs

5.80.1.2 required int32 nsec = 2

5.80.1.3 message Time

Initial value:

```
{
  required int32 sec = 1
```

5.81 topic_info.proto File Reference

Variables

- package gazebo **msgs**
- import publish **proto**
- repeated **Publish publisher** = 2
- repeated **Subscribe subscriber** = 3
- message **TopicInfo**

5.81.1 Variable Documentation

5.81.1.1 package gazebo msgs

5.81.1.2 import subscribe proto

5.81.1.3 repeated Publish publisher = 2

5.81.1.4 repeated Subscribe subscriber = 3

5.81.1.5 message TopicInfo

Initial value:

```
{
  required string msg_type       = 1
```

5.82 track_visual.proto File Reference

Variables

- optional bool **inherit_orientation** = 2
- optional double **max_dist** = 4
- optional double **min_dist** = 3
- package gazebo **msgs**
- message **TrackVisual**

5.82.1 Variable Documentation

5.82.1.1 optional bool inherit_orientation = 2

5.82.1.2 optional double max_dist = 4

5.82.1.3 optional double min_dist = 3

5.82.1.4 package gazebo msgs

5.82.1.5 message TrackVisual

Initial value:

```
{
  required string name              = 1
```

5.83 vector2d.proto File Reference

Variables

- package gazebo **msgs**

- import header **proto**
- message **Vector2d**
- required double **y** = 2

5.83.1 Variable Documentation

5.83.1.1 package gazebo msgs

5.83.1.2 import header proto

5.83.1.3 message Vector2d

Initial value:

```
{
  required double x = 1
```

5.83.1.4 required double y = 2

5.84 vector3d.proto File Reference

Variables

- package gazebo **msgs**
- import header **proto**
- message **Vector3d**
- required double **y** = 3
- required double **z** = 4

5.84.1 Variable Documentation

5.84.1.1 package gazebo msgs

5.84.1.2 import header proto

5.84.1.3 message Vector3d

Initial value:

```
{
  required double x = 2
```

5.84.1.4 required double y = 3

5.84.1.5 required double z = 4

5.85 visual.proto File Reference

Variables

- optional bool **cast_shadows** = 3
- optional bool **delete_me** = 11
- optional **Geometry geometry** = 7
- optional bool **is_static** = 12
- optional double **laser_retro** = 5
- optional **Material material** = 8
- package gazebo **msgs**
- required string **parent_name** = 2
- optional **Plugin plugin** = 13
- optional **Pose pose** = 6
- import **pose proto**
- optional double **transparency** = 4
- optional bool **visible** = 9
- message **Visual**

5.85.1 Variable Documentation

5.85.1.1 optional bool cast_shadows = 3

5.85.1.2 optional bool delete_me = 11

5.85.1.3 optional Geometry geometry = 7

5.85.1.4 optional bool is_static = 12

5.85.1.5 optional double laser_retro = 5

5.85.1.6 optional Material material = 8

5.85.1.7 package gazebo msgs

5.85.1.8 required string parent_name = 2

5.85.1.9 optional Plugin plugin = 13

5.85.1.10 optional Pose pose = 6

5.85.1.11 import plugin proto

5.85.1.12 optional double transparency = 4

5.85.1.13 optional bool visible = 9

5.85.1.14 message Visual

Initial value:

```
{
  required string name         = 1
```

5.86 world_control.proto File Reference

Variables

- package gazebo **msgs**
- optional uint32 **multi_step** = 3
- import world_reset **proto**
- optional **WorldReset reset** = 4
- optional uint32 **seed** = 5
- optional bool **step** = 2
- message **WorldControl**

5.86.1 Variable Documentation

5.86.1.1 package gazebo msgs

5.86.1.2 optional uint32 multi_step = 3

5.86.1.3 import world_reset proto

5.86.1.4 optional WorldReset reset = 4

5.86.1.5 optional uint32 seed = 5

5.86.1.6 optional bool step = 2

5.86.1.7 message WorldControl

Initial value:

```
{
  optional bool pause           = 1
```

5.87 world_modify.proto File Reference

Variables

- optional bool **create** = 3
- package gazebo **msgs**
- optional bool **remove** = 2
- message **WorldModify**

5.87.1 Variable Documentation

5.87.1.1 optional bool create = 3

5.87.1.2 package gazebo msgs

5.87.1.3 optional bool remove = 2

5.87.1.4 message WorldModify

Initial value:

```
{
  required string world_name = 1
```

5.88 world_reset.proto File Reference

Variables

- optional bool **model_only** = 3[default = false]
- package gazebo **msgs**
- import header **proto**
- optional bool **time_only** = 2[default = false]
- message **WorldReset**

5.88.1 Variable Documentation

5.88.1.1 optional bool model_only = 3[default = false]

5.88.1.2 package gazebo msgs

5.88.1.3 import header proto

5.88.1.4 optional bool time_only = 2[default = false]

5.88.1.5 message WorldReset

Initial value:

```
{
  optional bool all          = 1[default = true]
```

5.89 world_stats.proto File Reference

Variables

- required uint64 **iterations** = 6
- optional int32 **model_count** = 7
- package gazebo **msgs**
- required **Time pause_time** = 3
- required bool **paused** = 5
- import header **proto**
- required **Time real_time** = 4
- message **WorldStatistics**

5.89.1 Variable Documentation

5.89.1.1 required uint64 iterations = 6

5.89.1.2 optional int32 model_count = 7

5.89.1.3 package gazebo msgs

5.89.1.4 required Time pause_time = 3

5.89.1.5 required bool paused = 5

5.89.1.6 import time proto

5.89.1.7 required Time real_time = 4

5.89.1.8 message WorldStatistics

Initial value:

```
{
  required Time  sim_time    = 2
```

5.90 wrench.proto File Reference

Variables

- package gazebo **msgs**
- import vector3d **proto**
- required **Vector3d torque** = 2
- message **Wrench**

5.90.1 Variable Documentation

5.90.1.1 package gazebo msgs

5.90.1.2 import vector3d proto

5.90.1.3 required Vector3d torque = 2

5.90.1.4 message Wrench

Initial value:

```
{
  required Vector3d force  = 1
```

5.91 wrench_stamped.proto File Reference

Variables

- package gazebo **msgs**
- import **time proto**
- required **Wrench wrench** = 2
- message **WrenchStamped**

5.91.1 Variable Documentation

5.91.1.1 package gazebo msgs

5.91.1.2 import wrench proto

5.91.1.3 required Wrench wrench = 2

5.91.1.4 message WrenchStamped

Initial value:

```
{

  required Time time       = 1
```

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