

# Defining Domains and Domain Participants

All Domain Participants are assigned to the Domain regardless of where they are in the containment hierarchy. Domain Participants should have at least one instance which can be any kind of lock property typed by Domain Participant. During DDS XML generation, all properties of the Block are considered a Domain Participants.

You can create Domain and Domain Participants by using:

- The Containment tree.
- DDS Domain Table.

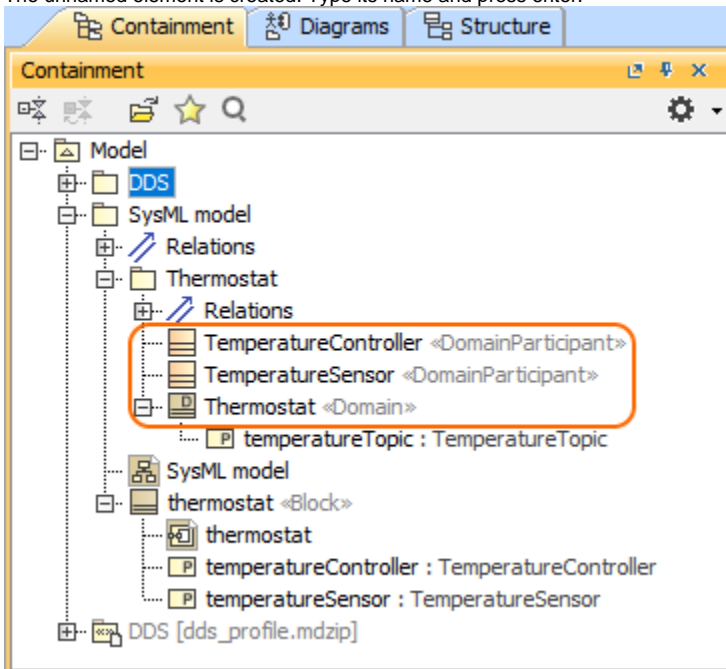
This page contains the following topics:

- [Creating Domain and Domain Participants by using the Containment tree](#)
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## Creating Domain and Domain Participants by using the Containment tree

To create a Domain Participant or Domain in the Containment tree

1. In the [Containment tree](#), right-click a Package wherein you want to create Domain Participants or Domain.
2. From the shortcut menu, select **Create Element** and from the opened dialog, select DomainParticipant or Domain.
3. The unnamed element is created. Type its name and press enter.



## Creating Domain and Domain Participants by using the DDS Domain Table

You can use the DDS Domain Table to create a Domain inside a Domain Library. It also helps to assign Topics and Domain Participants to the Domain. The DDS Domain Table named Domain is already created in predefined DDS Package structure. If you want to create a new one, follow the procedure below.

To create an empty DDS Domain Table

1. In the [Containment tree](#), right-click a predefined *Domain* Package.
2. From the shortcut menu, select **Create Diagram** and from the opened dialog, select DDS Domain Table.
3. The unnamed table is created. Type its name and press enter.

To fill in the DDS Domain Table

1. From the table toolbar, click the **Add New** button. The new row appears and DDSDomain element is created in the model.
2. In the table, specify the following:
  - Double-click **Name** cell and type a domain name.
  - Double-click the **Domain\_id** cell and type domain id number.
  - Double-click the **Topics** cell, select ... and in the **Select Elements** dialog choose already created topics or use the **Creation Mode** to create new topics.



Topics referenced by a Domain Participants must be assigned to every Domain that the participant is assigned to. Unassigned Topics lead to validation errors.

- Double-click the **Participants** cell, select ... and in the **Select Elements** dialog choose already created Domain Participants or use the **Creation Mode** to create new Domain Participants.
- The **Participant Instances** column fill in automatically when instances are created in the model. [How to create Participant Instances >>](#)

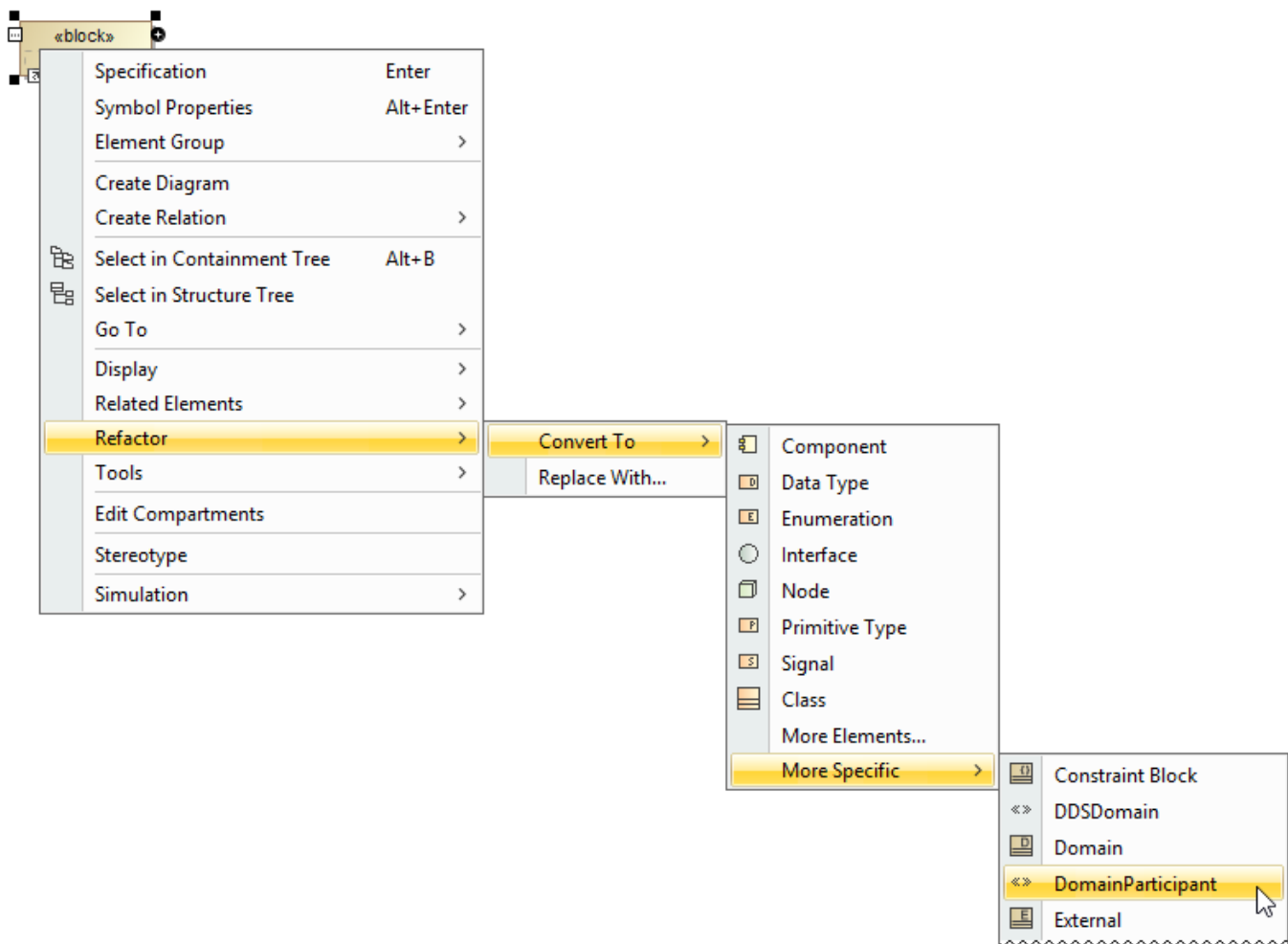
#	Name	Domain_id	Topics	Participants	Participant instances
1	Thermostat	1	TemperatureTopic	TemperatureController TemperatureSensor	temperatureController : TemperatureController temperatureSensor : TemperatureSensor

Domain name      Domain id      Topics in the domain      Domain Participants participating in the domain      Actual instances of Domain Participants in the domain

## Creating Domain Participants by refactoring the Block

To create a Domain Participant or Domain by refactoring a Block

1. In the [Containment tree](#), right-click a Package wherein you want to create Domain Participants or Domain.
2. From the shortcut menu, select **Create Element** and from the opened dialog, select Block.
3. Right-click the Block and select **Refactor > Convert To > More Specific > Domain Participant** or **Domain**. The Block is refactored to the Domain Participant or Domain.



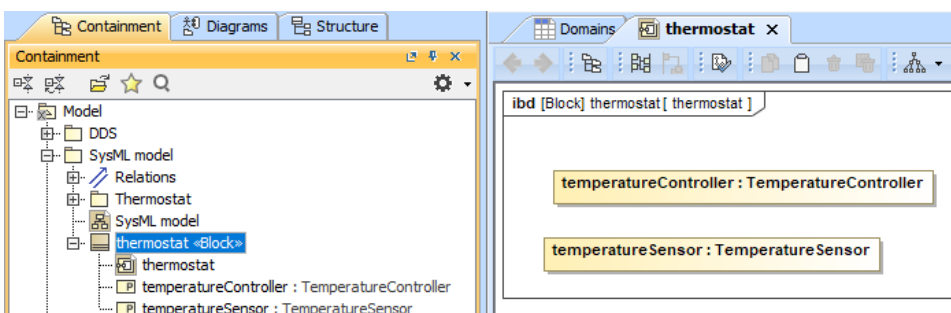
## Creating instances

The difference between instances of Domain Participants and Members of DDS Data types are the following:

- Domain Participant instances: are any Block property typed by Domain Participant. They can be any kind of property: Value Property, Part Property, Reference Property etc.
- Members: DDS Data type Members are used in the data definition section of the meta-model. They allow to define custom, DDS annotated data types. They rely heavily on multiplicity definitions in order to be able to produce a syntactically correct DDS xml output.

To create a Domain Participant instances

1. In the [Containment tree](#), right-click a Block which will be the owner of the instances.
2. From the shortcut menu, select **Create Diagram** and from the opened dialog, select SysML Internal Block Diagram.
3. From the [diagram palette](#) select a property (e.g. Part Property) and click on the diagram pane.
4. Type the name of the property.
5. Select a Domain Participant as type of the property.  
The instance of Domain Participant is created.



## Defining instances multiplicity

To define a instances as an array or sequence, its multiplicity needs to be changed as it follows, where N must be at least 1 and M must be greater than N.

Lower Value	Upper Value	Multiplicity	Type
N	N	N	Array
0	-1	0 .. *	Boundless Array
0	N-1	0 .. N-1	Sequence
N	M	N .. M	Sequence

To change the instance multiplicity

1. Double-click the Part Property to open it's [Specification window](#).
2. Select the Multiplicity property value or type Lower Value and Upper Value.

**Specification of Part Property temperatureController**

**Specification of Part Property properties**

Specify properties of the selected Part Property in the properties specification table. Choose the Expert or All options from the Properties drop-down list to see more properties.

**temperatureController**

Properties: Standard

<b>Part Property</b>	
Name	temperatureController
Type	TemperatureController [SysML model:...
Default Value	
Owned By	thermostat [SysML model]
Applied Stereotype	PartProperty [Property] [MD Customizati
Multiplicity	10
Is Read Only	<input type="checkbox"/> false
Is Static	<input type="checkbox"/> false
Aggregation	composite
Is Derived	<input type="checkbox"/> false
To Do	

Type here to filter properties

Close Back Forward Help