

# **PART 2**

## **Diagram Functions**



# Introduction to Part 2

## Contents of Part 2

Part 2 is divided into the following chapters:

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Obtaining CPN Simulation Information

## Feedback

The feedback from Design/CPN separates and surrounds names, numbers, and other indicators with certain characters. Those characters are:

? \* @ : -> ( ) [ ] { }

Do not use these characters in names if you want to receive reasonable looking feedback.



# **Chapter 8**

## **Converting Auxiliary Objects to CPN Objects**

### **Converting Auxiliary Objects to CPN Objects**

The functions described in this chapter convert new pages into CPN model pages, and graphical objects into CP net components.

The dictionary of conversion functions begins on the next page.

### **MakeCpnPage**

Converts a newly created Design page into a CPN page.

#### **Synopsis**

```
MakeCpnPage : gid -> unit  
exception cpndbFail : string
```

#### **Description**

This routine takes an existing page created by means of `DSStr_NewPage` and makes it become a CPN page, so that it will have a page node on the diagram hierarchy page, and it can be used as a subpage for substitution transition.

#### **Arguments**

ID of Design page

#### **Return value**

None.

#### **Exceptions**

Raised if unsuccessful.

## MakeGlobDec

Converts an auxiliary node into a CPN global declaration.

### Synopsis

```
MakeGlobDec : gid -> unit  
exception cpndbFail : string
```

### Description

This function takes an existing node created by means of `DSStr_CreateNode` and makes it become a CPN global declaration. If there is text in the node, it will become the text of the CPN global declaration.

### Arguments

ID of auxiliary node .

### Return value

None.

### Exceptions

Raised if unsuccessful.

### Related Functions

`DSStr_CreateNode`.

### **MakeTempDec**

Converts an auxiliary node into a CPN temporary declaration.

#### **Synopsis**

```
MakeTempDec : gid -> unit  
exception cpndbFail : string
```

#### **Description**

This function takes an existing node created by means of `DSStr_CreateNode` and makes it become a CPN temporary declaration. If there is text in the node, it will become the text of the CPN temporary declaration.

#### **Arguments**

ID of auxiliary node.

#### **Return value**

None.

#### **Exceptions**

Raised if unsuccessful.

#### **Related Functions**

`DSStr_CreateNode`.

## MakeLocDec

Converts an auxiliary node into a CPN local declaration.

### Synopsis

```
MakeLocDec : {id : gid, pageid : gid} -> unit  
exception makeLocDec : unit  
exception cpndbFail : string
```

### Description

This function takes an existing node created by means of `DSStr_CreateNode` and an existing CPN page and makes the node become a CPN local declaration for the CPN page. If there is text in the node, it will become the text of the CPN local declaration. The node must be on the CPN page.

### Arguments

<code>id</code>	ID of auxiliary node
<code>pageid</code>	ID of CPN page

### Return value

None.

### Exceptions

<code>makeLocDec</code>	raised if <code>pageid</code> is not a valid CPN page id
<code>cpndbFail</code>	raised if unsuccessful.

### **MakePlace**

Converts an auxiliary node into a CPN place.

#### **Synopsis**

```
MakePlace : gid -> unit  
exception cpndbFail : string
```

#### **Description**

This function takes an existing node created by means of `DSStr_CreateNode` and makes it become a CPN place. If the place will have no CPN name region, the text in the auxiliary node will be used to generate the place name.

#### **Arguments**

ID of auxiliary node.

#### **Return value**

None.

#### **Exceptions**

Raised if unsuccessful.

## MakeTrans

Converts an auxiliary node into a CPN transition.

### Synopsis

```
MakeTrans : gid -> unit  
exception cpndbFail : string
```

### Description

This function takes an existing node created by means of `DSStr_CreateNode` and makes it become a CPN transition. If the transition will have no CPN name region, the text in the auxiliary node will be used to generate the transition name.

### Arguments

ID of auxiliary node.

### Return value

None.

### Exceptions

Raised if unsuccessful.

### **MakeArc**

Converts an existing connector into a CPN arc.

#### **Synopsis**

```
MakeArc : gid -> unit  
exception cpndbFail : string
```

#### **Description**

This routine takes an existing connector created by means of `DSStr_CreateConn` and makes it become a CPN arc.

#### **Arguments**

ID of auxiliary connector.

#### **Return value**

None.

#### **Exceptions**

Raised if unsuccessful.

## MakeName

Converts an auxiliary node into a CPN name region.

### Synopsis

```
MakeName : {cpnnodeid:gid,id:gid} -> unit  
exception makeName : unit  
exception cpndbFail : string
```

### Description

This function takes an existing label created by means of `DSStr_CreateLabel` and makes it become a CPN name region for a CPN place or for a CPN transition. The text of the label will become the text of the CPN name region.

### Arguments

<code>cpnnodeid</code>	ID of CPN place or transition.
<code>id</code>	ID of auxiliary node.

### Return value

None.

### Exceptions

<code>makeName</code>	raised if <code>cpnnodeid</code> is not a valid CPN place or transition <code>id</code>
<code>cpndbFail</code>	raised if unsuccessful.

### MakeColor

Converts an auxiliary node into a CPN color set region.

#### Synopsis

```
MakeColor : {id:gid,placeid:gid} -> unit  
exception makeColor : unit  
exception cpndbFail : string
```

#### Description

This function takes an existing label created by means of `DSStr_CreateLabel` and makes it become a CPN color set region for a CPN place. The text of the label will become the text of the CPN color set region.

#### Arguments

<code>id</code>	ID of auxiliary node.
<code>placeid</code>	ID of CPN place.

#### Return value

None.

#### Exceptions

<code>makeColor</code>	raised if <code>placeid</code> is not a valid CPN place id.
<code>cpndbFail</code>	raised if unsuccessful.

## MakeInitMark

Converts an auxiliary node into a CPN initial marking region.

### Synopsis

```
MakeInitMark : {id:gid,placeid:gid} -> unit  
exception makeInitMark : unit  
exception cpndbFail : string
```

### Description

This function takes an existing label created by means of `DSStr_CreateLabel` and makes it become a CPN initial marking region for a CPN place. The text of the label will become the text of the CPN initial marking region.

### Arguments

<code>id</code>	ID of auxiliary node.
<code>placeid</code>	ID of CPN place.

### Return value

None.

### Exceptions

<code>makeInitMark</code>	raised if <code>placeid</code> is not a valid CPN place id.
<code>cpndbFail</code>	raised if unsuccessful.

### MakeGuard

Converts an auxiliary node into a CPN guard region.

#### Synopsis

```
MakeGuard : {id:gid,transid:gid} -> unit  
exception makeGuard : unit  
exception cpndbFail : string
```

#### Description

This function takes an existing label created by means of `DSStr_CreateLabel` and makes it become a CPN guard region for a CPN transition. The text of the label will become the text of the CPN guard region.

#### Arguments

<code>id</code>	ID of auxiliary node.
<code>transid</code>	ID of CPN transition.

#### Return value

None.

#### Exceptions

<code>makeGuard</code>	raised if <code>transid</code> is not a valid CPN transition id.
<code>cpndbFail</code>	raised if unsuccessful.

## MakeCodeSeg

Converts an auxiliary node into a CPN code segment region.

### Synopsis

```
MakeCodeSeg : {id:gid,transid:gid} -> unit  
exception makeCodeSeg : unit  
exception cpndbFail : string
```

### Description

This function takes an existing node created by means of `DSStr_CreateNode` and makes it become a CPN code segment region for a CPN transition. If there is `text` in the node, it will become the text of the CPN code segment region.

### Arguments

`id` ID of auxiliary node.  
`transid` ID of CPN transition.

### Return value

None.

### **MakeTime**

Converts an auxiliary node into a CPN time region.

#### **Synopsis**

```
MakeTime : {id:gid,transid:gid} -> unit  
exception makeTime : unit  
exception cpndbFail : string
```

#### **Description**

This function takes an existing label created by means of `DSStr_CreateLabel` and makes it become a CPN time region for a CPN transition. The text of the label will become the text of the CPN time region.

#### **Arguments**

<code>id</code>	ID of auxiliary node.
<code>transid</code>	ID of CPN transition.

#### **Return value**

None.

## MakePrimePage

Flags a CPN page node as a prime page.

### Synopsis

```
MakePrimePage : {id:gid,mult:int} -> unit  
exception cpndbFail : string
```

### Description

This function takes a page and flags it as a prime page.

### Arguments

id     ID of page.  
mult   multiplicity of the page.

### Return value

None.

### MakeArcExp

Converts an auxiliary node into a CPN arc expression region.

#### Synopsis

```
MakeArcExp : {arcid:gid,id:gid} -> unit  
exception makeArcExp : unit  
exception cpndbFail : string
```

#### Description

This function takes an existing label created by means of `DSStr_CreateLabel` and makes it become a CPN arc expression region for a CPN arc. The text of the label will become the text of the CPN arc expression region.

#### Arguments

<code>arcid</code>	ID of CPN arc.
<code>id</code>	ID of auxiliary node.

#### Return value

None.

#### Exceptions

<code>makeArcExp</code>	raised if <code>arcid</code> is not a valid CPN arc id.
<code>cpndbFail</code>	raised if unsuccessful.

# Chapter 9

## Creating CPN Hierarchies

### Creating CPN Hierarchies

The functions described in this chapter convert ordinary CPN objects into objects that have a particular significance in the hierarchy of the net.

The dictionary of functions for creating CPN hierarchies begins on the next page.

### MakeInPort

Converts a CPN place or transition into a CPN input port node.

#### Synopsis

```
MakeInPort : gid -> unit  
exception MakePort : unit  
exception cpndbFail : string
```

#### Description

This function takes an existing CPN place or transition created by means of `DSStr_CreateNode` and `MakePlace` or `MakeTrans` and makes it become a CPN input port node.

#### Arguments

ID of CPN place or transition

#### Return value

None.

#### Exceptions

<code>MakePort</code>	raised if id is not a valid CPN place or transition id.
<code>cpndbFail</code>	raised if unsuccessful.

#### Related Functions

`MakePlace`, `MakeTrans`, `AssignPort`.

## MakeOutPort

Converts a CPN place or transition into a CPN output port node.

### Synopsis

```
MakeOutPort : gid -> unit  
exception MakePort : unit  
exception cpndbFail : string
```

### Description

This function takes an existing CPN place or transition created by means of `DSStr_CreateNode` and `MakePlace` or `MakeTrans` and makes it become a CPN output port node.

### Arguments

ID of CPN place or transition

### Return value

None.

### Exceptions

<code>MakePort</code>	raised if id is not a valid CPN place or transition id.
<code>cpndbFail</code>	raised if unsuccessful.

### Related Functions

`MakePlace`, `MakeTrans`, `AssignPort`.

### MakeInOutPort

Converts a CPN place or transition into a CPN input/output port node.

#### Synopsis

```
MakeInOutPort : gid -> unit  
exception MakePort : unit  
exception cpndbFail : string
```

#### Description

This function takes an existing CPN place or transition created by means of `DSStr_CreateNode` and `MakePlace` or `MakeTrans` and makes it become a CPN input/output port node.

#### Arguments

ID of CPN place or transition

#### Return value

None.

#### Exceptions

<code>MakePort</code>	raised if id is not a valid CPN place or transition id.
<code>cpndbFail</code>	raised if unsuccessful.

#### Related Functions

`MakePlace`, `MakeTrans`, `AssignPort`.

## MakeGenPort

Converts a CPN place or transition into a CPN general port node.

### Synopsis

```
MakeGenPort : gid -> unit  
exception MakePort : unit  
exception cpndbFail : string
```

### Description

This function takes an existing CPN place or transition created by means of `DSStr_CreateNode` and `MakePlace` or `MakeTrans` and makes it become a CPN general port node.

### Arguments

ID of CPN place or transition

### Return value

None.

### Exceptions

<code>MakePort</code>	raised if id is not a valid CPN place or transition id.
<code>cpndbFail</code>	raised if unsuccessful.

### Related Functions

`MakePlace`, `MakeTrans`, `AssignPort`.

### MakeTransSub

Converts a CPN transition into a CPN substitution transition.

#### Synopsis

```
MakeTransSub : {subpageid:gid,transid:gid} -> unit  
exception makeTransSub : unit  
exception cpndbFail : string
```

#### Description

This function takes an existing CPN transition created by means of `DSStr_CreateNode` and `MakeTrans` and makes it become a CPN substitution transition.

#### Arguments

<code>transid</code>	ID of transition.
<code>subpageid</code>	ID of CPN page to become the subpage of the substitution transition.

#### Return value

None.

#### Exceptions

<code>makeTransSub</code>	raised if <code>transid</code> is not a valid CPN transition id or if <code>subpageid</code> is not a valid CPN page id.
<code>cpndbFail</code>	raised if unsuccessful.

#### Related Functions

`MakePage`, `MakeTrans`.

## AssignPort

Assigns a CPN port node to a CPN socket node for a CPN compound node.

### Synopsis

```
AssignPort : {id:gid,port:gid,socket:gid} -> unit  
exception PortAssign : unit  
exception cpndbFail : string
```

### Description

This function takes an existing CPN socket node for a given CPN compound node and assigns a CPN port node to it .

### Arguments

id	ID of CPN compound node.
port	ID of CPN port node
socket	ID of CPN socket node.

### Return value

None.

### Exceptions

PortAssign	raised if id is not a valid CPN compound node id or if port is not a CPN port node id.
cpndbFail	raised if unsuccessful.

### Related Functions

MakeInPort, MakeOutPort , MakeInOutPort , MakeGenPort ,  
MakeTransSub , MakeTransInv , MakePlaceSub .

### MakeGlobalPlaceFus

Creates a CPN global fusion set and adds a CPN place to it.

#### Synopsis

```
MakeGlobalPlaceFus :  
  {name:string,placeid:gid} -> unit  
exception MakeFus : unit  
exception cpndbFail : string
```

#### Description

This function takes a string of characters and a CPN place and creates a CPN global fusion set using the string as the name of the fusion set and adds the CPN place to it.

#### Arguments

name	TEXT to become the name of CPN fusion set.
placeid	ID of CPN place.

#### Return value

None.

#### Exceptions

MakeFus	raised if placeid is not a valid CPN place id or if name is already a fusion set name.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakePlace, IsGlobalPlaceFus, IsPagePlaceFus, IsGlobalTransFus, IsPageTransFus, AddToGlobalPlaceFus.

## MakePagePlaceFus

Creates a CPN page fusion set and adds a CPN place to it.

### Synopsis

```
MakePagePlaceFus :  
{name:string,pageid:gid,placeid:gid} -> unit  
exception MakeFus : unit  
exception cpndbFail : string
```

### Description

This function takes a string of characters, a CPN page and a CPN place and creates a CPN page fusion set using the string as the name of the fusion set and adds the CPN place to it.

### Arguments

name	TEXT to become the name of CPN fusion set.
pageid	ID of CPN page.
placeid	ID of CPN place.

### Return value

None.

### Exceptions

MakeFus	raised if placeid is not a valid CPN place id or if pageid is not a valid CPN page id or if name is already a fusion set name.
cpndbFail	raised if unsuccessful.

### Related Functions

MakeCpnPage, MakePlace, IsGlobalPlaceFus, IsPagePlaceFus, IsGlobalTransFus, IsPageTransFus, AddToPagePlaceFus.

### MakeInstPlaceFus

Creates a CPN instance fusion set and adds a CPN place to it.

#### Synopsis

```
MakeInstPlaceFus :  
{name:string,pageid:gid,placeid:gid} -> unit  
exception MakeFus : unit  
exception cpndbFail : string
```

#### Description

This function takes a string of characters, a CPN page and a CPN place and creates a CPN instance fusion set using the string as the name of the fusion set and adds the CPN place to it.

#### Arguments

name	TEXT to become the name of CPN fusion set.
pageid	ID of CPN page.
placeid	ID of CPN place.

#### Return value

None.

#### Exceptions

MakeFus	raised if placeid is not a valid CPN place id or if pageid is not a valid CPN page id or if name is already a fusion set name.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakeCpnPage, MakePlace, IsGlobalPlaceFus, IsPagePlaceFus, IsGlobalTransFus, IsPageTransFus, AddToPagePlaceFus.

## AddToGlobalPlaceFus

Adds a CPN place to a CPN global fusion set.

### Synopsis

```
AddToGlobalPlaceFus :  
  {name:string,placeid:gid} -> unit  
exception AddToFus : unit  
exception cpndbFail : string
```

### Description

This function takes a string of characters as the name of the fusion set and a CPN place and adds the CPN place to the fusion set.

### Arguments

name	TEXT of CPN fusion set name.
placeid	ID of CPN place.

### Return value

None.

### Exceptions

AddToFus	raised if placeid is not a valid CPN place id or if name is not already a fusion set name.
cpndbFail	raised if unsuccessful.

### Related Functions

MakePlace, MakeGlobalPlaceFus, IsGlobalPlaceFus.

### AddToPagePlaceFus

Adds a CPN place to a CPN page or instance fusion set.

#### Synopsis

```
AddToPagePlaceFus :  
{name:string,pageid:gid,placeid:gid} -> unit  
exception AddToFus : unit  
exception cpndbFail : string
```

#### Description

This function takes a string of characters as the name of the fusion set, a CPN page and a CPN place and adds the CPN place to the fusion set.

#### Arguments

name	TEXT of CPN fusion set name.
pageid	ID of CPN page.
placeid	ID of CPN place.

#### Return value

None.

#### Exceptions

AddToFus	raised if placeid is not a valid CPN place id or if pageid is not a valid CPN page id or if name is not already a fusion set name.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakeCpnPage, MakePlace, MakePagePlaceFus, MakeInstPlaceFus, IsPagePlaceFus.

## AddToGlobalTransFus

Adds a CPN transition to a CPN global fusion set.

### Synopsis

```
AddToGlobalTransFus :  
  {name:string,transid:gid} -> unit  
exception AddToFus : unit  
exception cpndbFail : string
```

### Description

This function takes a string of characters as the name of the fusion set and a CPN transition and adds the CPN transition to the fusion set.

### Arguments

name	TEXT of CPN fusion set name.
transid	ID of CPN transition .

### Return value

None.

### Exceptions

AddToFus	raised if transid is not a valid CPN transition id or if name is not already a fusion set name.
cpndbFail	raised if unsuccessful.

### Related Functions

MakeTrans, MakeGlobalTransFus, IsGlobalTransFus.

### AddToPageTransFus

Adds a CPN transition to a CPN page or instance fusion set.

#### Synopsis

```
AddToPageTransFus :  
{name:string,pageid:gid,transid:gid} -> unit  
exception AddToFus : unit  
exception cpndbFail : string
```

#### Description

This function takes a string of characters as the name of the fusion set, a CPN page and a CPN transition and adds the CPN transition to the fusion set.

#### Arguments

name	TEXT of the CPN fusion set name.
pageid	ID of CPN page.
transid	ID of CPN transition .

#### Return value

None.

#### Exceptions

AddToFus	raised if placeid is not a valid CPN transition id or if pageid is not a valid CPN page id or if name is not already a fusion set name.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakeCpnPage, MakeTrans, MakePageTransFus,  
MakeInstTransFus, IsPageTransFus.

# Chapter 10

## Accessing CPN Diagram Structure

### Accessing CPN Diagram Structure

The functions described in this chapter return the CPN attributes, as distinct from purely graphical attributes, of objects in a CP net.

The dictionary of functions for accessing CPN diagram structure begins on the next page.

### **IsGlobalPlaceFus**

Verifies if a string of characters is used as a CPN place global fusion set name.

#### **Synopsis**

```
IsGlobalPlaceFus : string -> bool  
exception cpndbFail : string
```

#### **Description**

This function takes a string of characters and returns true if it is already used as a CPN place global fusion set name.

#### **Arguments**

TEXT.

#### **Return value**

TRUE if the string is used as a CPN place global fusion set name.  
FALSE otherwise.

#### **Exceptions**

cpndbFail      raised if unsuccessful.

#### **Related Functions**

MakeGlobalPlaceFus.

## IsPagePlaceFus

Verifies if a string of characters is used as a CPN place page or instance fusion set name.

### Synopsis

```
IsPagePlaceFus : {name:string,pageid:gid} -> bool  
exception isPagePlaceFus : unit  
exception cpndbFail : string
```

### Description

This function takes a string of characters and a CPN page and returns true if the string is already used as a CPN place page or instance fusion set name.

### Arguments

name	TEXT.
pageid	ID of CPN page.

### Return value

TRUE if the string is used as a CPN place page or instance fusion set name.

FALSE otherwise.

### Exceptions

isPagePlaceFus	raised if pageid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

### Related Functions

MakePagePlaceFus, MakeInstancePlaceFus.

### IsPort

Verifies if a CPN place or transition is a CPN port node.

### Synopsis

```
IsPort : gid -> bool  
exception isport : unit  
exception cpndbFail : string
```

### Description

This function takes a CPN place or transition and returns true if it is a CPN port node.

### Arguments

ID of CPN place or transition.

### Return value

TRUE if the CPN place or transition is a CPN port node.  
FALSE otherwise.

### Exceptions

isport            raised if ID is not a valid CPN place or transition id.  
cpndbFail        raised if unsuccessful.

### Related Functions

MakeInPort, MakeOutPort, MakeInOutPort, MakeGenPort.

### GetPageName

Gets the text of the name of a CPN page.

#### Synopsis

```
GetPageName : gid -> string  
exception PageName : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns the text of the name of the CPN page.

#### Arguments

ID of CPN page.

#### Return value

Text containing the name of the CPN page.

#### Exceptions

PageName	raised if pageid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakeCpnPage.

### GetNameText

Gets the text of the name region of a CPN place or transition.

#### Synopsis

```
GetNameText : gid -> string  
exception getNameText : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN place or transition and returns the text of the name region of the CPN place or transition. If there is no CPN name region associated with the CPN place or transition then the text in the CPN node itself will be returned.

#### Arguments

ID of CPN place or transition.

#### Return value

Text containing the name of the CPN place or transition.

#### Exceptions

<code>getNameText</code>	raised if <code>gid</code> is not a valid place or transition id.
<code>cpndbFail</code>	raised if unsuccessful.

#### Related Functions

`MakePlace`, `MakeTrans`.

### GetName

Gets the ID of the CPN name region of a CPN place or transition.

### Synopsis

```
GetName : gid -> gid  
exception getName : unit  
exception cpndbFail : string
```

### Description

This function takes a CPN place or transition and returns the name region of the CPN place or transition. If there is no CPN name region associated with the CPN place or transition then 0 will be returned.

### Arguments

ID of CPN place or transition.

### Return value

ID of the CPN name region, or 0 if it does not exist.

### Exceptions

getName	raised if gid is not a valid CPN place or transition id.
cpndbFail	raised if unsuccessful.

### Related Functions

MakeName.

### GetColor

Gets the ID of the CPN color set region of a CPN place.

#### Synopsis

```
GetColor : gid -> gid  
exception getColor : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN place and returns its color set region. If there is no CPN color set region associated with the CPN place then 0 will be returned.

#### Arguments

ID of CPN place.

#### Return value

ID of the CPN color set region or 0 if it does not exist.

#### Exceptions

getColor	raised if gid is not a valid CPN place id.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakeColor.

## GetInitMark

Gets the ID of the CPN initial marking region of a CPN place.

### Synopsis

```
GetInitMark : gid -> gid  
exception getInitMark : unit  
exception cpndbFail : string
```

### Description

This function takes a CPN place and returns its initial marking region. If there is no CPN initial marking region associated with the CPN place then 0 will be returned.

### Arguments

ID of CPN place.

### Return value

ID of the CPN initial marking region or 0 if it does not exist.

### Exceptions

<code>getInitMark</code>	raised if gid is not a valid CPN place id.
<code>cpndbFail</code>	raised if unsuccessful.

### Related Functions

`MakeInitMark`.

### GetGuard

Gets the ID of the CPN guard region of a CPN transition.

#### Synopsis

```
GetGuard : gid -> gid
exception getGuard : unit
exception cpndbFail : string
```

#### Description

This function takes a CPN transition and returns its guard region. If there is no CPN guard region associated with the CPN transition then 0 will be returned.

#### Arguments

ID of CPN transition.

#### Return value

ID of the CPN guard region or 0 if it does not exist.

#### Exceptions

getGuard	raised if gid is not a valid CPN transition id.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakeGuard.

## GetTime

Gets the ID of the CPN time region of a CPN transition.

### Synopsis

```
GetTime : gid -> gid  
exception getTime : unit  
exception cpndbFail : string
```

### Description

This function takes a CPN transition and returns its time region. If there is no CPN time region associated with the CPN transition then 0 will be returned.

### Arguments

ID of CPN transition.

### Return value

ID of the CPN time region or 0 if it does not exist.

### Exceptions

getTime	raised if gid is not a valid CPN transition id.
cpndbFail	raised if unsuccessful.

### Related Functions

MakeTime.

### GetCodeSeg

Gets the ID of the CPN code segment region of a CPN transition or chart node.

#### Synopsis

```
GetCodeSeg : gid -> gid  
exception getCodeSeg : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN transition or chart node and returns its code segment region. If there is no CPN code segment associated with the CPN transition or chart node then 0 will be returned.

#### Arguments

ID of CPN transition or chart node.

#### Return value

ID of the CPN code segment or 0 if it does not exist.

#### Exceptions

<code>getCodeSeg</code>	raised if <code>gid</code> is not a valid CPN transition or chart node id.
<code>cpndbFail</code>	raised if unsuccessful.

#### Related Functions

`MakeCodeSeg`.

### GetArcExp

Gets the ID of the CPN arc expression region of a CPN arc.

#### Synopsis

```
GetArcExp : gid -> gid  
exception getArcExp : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN arc and returns its arc expression region. If there is no CPN arc expression associated with the CPN arc then 0 will be returned.

#### Arguments

ID of CPN arc.

#### Return value

ID of the CPN arc expression or 0 if it does not exist.

#### Exceptions

getArcExp	raised if gid is not a valid CPN arc id.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakeArcExp.

## Diagram Functions

---

### GetPort

Gets the ID of the CPN port region of a CPN place or transition.

#### Synopsis

```
GetPort : gid -> gid
exception getPort : unit
exception cpndbFail : string
```

#### Description

This function takes a CPN place or transition and returns the port region of the CPN place or transition. If there is no CPN port region associated with the CPN place or transition then 0 will be returned.

#### Arguments

ID of CPN place or transition.

#### Return value

ID of the CPN port region or 0 if it does not exist.

#### Exceptions

getPort	raised if gid is not a valid CPN place or transition id.
cpndbFail	raised if unsuccessful.

#### Related Functions

MakeInPort, MakeOutPort, MakeInOutPort, MakeGenPort.

## GetFusion

Gets the ID of the CPN fusion set region of a CPN place or transition.

### Synopsis

```
GetFusion : gid -> gid  
exception getFusion : unit  
exception cpndbFail : string
```

### Description

This function takes a CPN place or transition and returns the fusion set region of the CPN place or transition. If there is no CPN fusion set region associated with the CPN place or transition then 0 will be returned.

### Arguments

ID of CPN place or transition.

### Return value

ID of the CPN fusion set region or 0 if it does not exist.

### Exceptions

<code>getFusion</code>	raised if <code>gid</code> is not a valid CPN place or transition id.
<code>cpndbFail</code>	raised if unsuccessful.

### Related Functions

`MakeGlobalPlaceFusion`, `MakePagePlaceFusion`,  
`MakeInstPlaceFusion`, `MakeGlobalTransFusion`,  
`MakePageTransFusion`, `MakeInstTransFusion`.

### GetCpnInfo

Gets information on CPN objects.

#### Synopsis

```
GetCpnInfo : gid ->  
{objsubtyp:ObjSubType,objtyp:ObjType}  
exception cpndbFail : string
```

#### Description

This function takes any CPN object and returns type and subtype information for it. This function cannot be used to determine if a CPN place or transition belongs to a fusion set and cannot be applied to CPN regions.

#### Arguments

ID of CPN object.

#### Return value

objtyp	Page   DefBox   Place   Trans   Arc   Barchart   Linechart   Unknown.
objsubtyp	Simple   SubTr   SubPl   Glob   Temp   Loc   In   Out   InOut   Gen   Sub   Inv.

#### Exceptions

Raised if unsuccessful.

# Chapter 11

## Obtaining CPN Simulation Information

### Obtaining CPN Simulation Information

The functions described in the chapter return information about the status of CPN objects, pages, and subpages relative to simulation.

The dictionary of functions for obtaining CPN simulation information begins on the next page.

### IsPageIncluded

Verifies if a CPN page is included in the current simulation.

#### Synopsis

```
IsPageIncluded : gid -> bool  
exception PageModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns true if it is included in the current simulation run.

#### Arguments

ID of CPN page.

#### Return value

TRUE if the CPN page is included in the current simulation.  
FALSE otherwise.

#### Exceptions

PageModeAttr	raised if gid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

### IsPageProposed

Verifies if a CPN page participates in the occurrence set calculation for the current simulation.

#### Synopsis

```
IsPageProposed : gid -> bool  
exception PageModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns true if it participates in the occurrence set calculation for the current simulation run.

#### Arguments

ID of CPN page.

#### Return value

TRUE if the CPN page participates in the occurrence set calculation for the current simulation.

FALSE otherwise.

#### Exceptions

PageModeAttr	raised if gid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

### IsPageObserv

Verifies if a CPN page is observable in the current simulation.

#### Synopsis

```
IsPageObserv : gid -> bool  
exception PageModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns true if it is observable in the current simulation run.

#### Arguments

ID of CPN page.

#### Return value

TRUE if the CPN page is observable in the current simulation.  
FALSE otherwise.

#### Exceptions

PageModeAttr	raised if gid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

### IsPageCode

Verifies if the CPN transitions of a CPN page are executed with code segments in the current simulation.

#### Synopsis

```
IsPageCode : gid -> bool  
exception PageModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns true if its CPN transitions are executed with code segments in the current simulation run.

#### Arguments

ID of CPN page.

#### Return value

TRUE if the transitions of a CPN page are executed with code segments in the current simulation.

FALSE otherwise.

#### Exceptions

PageModeAttr	raised if gid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

### IsPageAuto

Verifies if a CPN page participates in the automatic run for the current simulation.

#### Synopsis

```
IsPageAuto : gid -> bool  
exception PageModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns true if it participates in the automatic run for the current simulation.

#### Arguments

ID of CPN page.

#### Return value

TRUE if the CPN page participates in the automatic run for the current simulation.

FALSE otherwise.

#### Exceptions

PageModeAttr	raised if gid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

## GetPageModeAttr

Gets the simulation mode attributes for a CPN page.

### Synopsis

```
GetPageModeAttr : gid ->  
{auto : bool , code : bool , included : bool ,  
  observ : bool , proposed : bool}  
exception PageModeAttr : unit  
exception cpndbFail : string
```

### Description

This function takes a CPN page and returns its mode attributes for the current simulation.

#### Arguments

ID of CPN page.

### Return value

auto	TRUE if the CPN page participates in the automatic run for the current simulation, FALSE otherwise.
code	TRUE if the transitions on the CPN page are executed with code segments for the current simulation, FALSE otherwise.
included	TRUE if the CPN page is included in the current simulation, FALSE otherwise.
observ	TRUE if the CPN page is observable in the current simulation, FALSE otherwise.
proposed	TRUE if the CPN page participates in the occurrence set calculation for the current simulation, FALSE otherwise.

### Exceptions

PageModeAttr	raised if gid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

### IsSubTransIncluded

Verifies if the subpage of a CPN substitution transition is included in the current simulation.

#### Synopsis

```
IsSubTransIncluded : gid -> bool  
exception SubTransModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN substitution transition and returns true if its subpage is included in the current simulation run.

#### Arguments

ID of CPN substitution transition.

#### Return value

TRUE if the subpage of the CPN substitution transition is included in the current simulation.

FALSE otherwise.

#### Exceptions

SubTransModeAttr	raised if gid is not a valid CPN substitution transition id.
cpndbFail	raised if unsuccessful.

### IsSubTransProposed

Verifies if the subpage of a CPN substitution transition participates in the occurrence set calculation for the current simulation.

#### Synopsis

```
IsSubTransProposed : gid -> bool  
exception SubTransModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN substitution transition and returns true if its subpage participates in the occurrence set calculation for the current simulation run.

#### Arguments

ID of CPN substitution transition.

#### Return value

TRUE if the subpage of the CPN substitution transition participates in the occurrence set calculation for the current simulation.

FALSE otherwise.

#### Exceptions

SubTransModeAttr	raised if gid is not a valid CPN substitution transition id.
cpndbFail	raised if unsuccessful.

### IsSubTransObserv

Verifies if the subpage of a CPN substitution transition is observable in the current simulation.

#### Synopsis

```
IsSubTransObserv : gid -> bool  
exception SubTransModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN substitution transition and returns true if its subpage is observable in the current simulation run.

#### Arguments

ID of CPN substitution transition.

#### Return value

TRUE if the subpage of the CPN substitution transition is observable in the current simulation.

FALSE otherwise.

#### Exceptions

SubTransModeAttr	raised if gid is not a valid CPN substitution transition id.
cpndbFail	raised if unsuccessful.

### IsSubTransCode

Verifies if the CPN transitions of the subpage of a CPN substitution transition are executed with code segments in the current simulation.

#### Synopsis

```
IsSubTransCode : gid -> bool  
exception SubTransModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN substitution transition and returns true if the CPN transitions of its subpage are executed with code segments in the current simulation run.

#### Arguments

ID of CPN substitution transition.

#### Return value

TRUE if the CPN transitions of the subpage of the CPN substitution transition are executed with code segments in the current simulation.

FALSE otherwise.

#### Exceptions

SubTransModeAttr	raised if gid is not a valid CPN substitution transition id.
cpndbFail	raised if unsuccessful.

### IsSubTransAuto

Verifies if the subpage of a CPN substitution transition participates in the automatic run for the current simulation.

#### Synopsis

```
IsSubTransAuto : gid -> bool  
exception SubTransModeAttr : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN substitution transition and returns true if its subpage participates in the automatic run for the current simulation.

#### Arguments

ID of CPN substitution transition.

#### Return value

TRUE if the subpage of the CPN substitution transition participates in the automatic run for the current simulation.

FALSE otherwise.

#### Exceptions

SubTransModeAttr	raised if gid is not a valid CPN substitution transition id.
cpndbFail	raised if unsuccessful.

## GetSubTransModeAttr

Gets the simulation mode attributes for the subpage of a CPN substitution transition.

### Synopsis

```
GetSubTransModeAttr : gid ->
{auto : bool, code : bool, included : bool,
 observ : bool, proposed : bool}
exception SubTransModeAttr : unit
exception cpndbFail : string
```

### Description

This function takes the subpage of a CPN substitution transition and returns its mode attributes for the current simulation.

### Arguments

ID of CPN substitution transition.

### Return value

auto	TRUE if the subpage of the CPN substitution transition participates in the automatic run for the current simulation, FALSE otherwise.
code	TRUE if the transitions on the subpage of the CPN substitution transition are executed with code segments for the current simulation, FALSE otherwise.
included	TRUE if the subpage of the CPN substitution transition is included in the current simulation, FALSE otherwise.
observ	TRUE if the subpage of the CPN substitution transition is observable in the current simulation, FALSE otherwise.
proposed	TRUE if the subpage of the CPN substitution transition participates in the occurrence set calculation for the current simulation, FALSE otherwise.

### Exceptions

SubTransModeAttr	raised if gid is not a valid CPN substitution transition id.
cpndbFail	raised if unsuccessful.

### IsPagePrime

Verifies if a CPN page is a prime page.

#### Synopsis

```
IsPrimePage : gid -> bool  
exception PrimePage: unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns true if it is a prime page.

#### Arguments

ID of CPN page.

#### Return value

TRUE if the CPN page is a prime page, FALSE otherwise.

#### Exceptions

PrimePage	raised if gid is not a valid CPN page id.
cpndbFail	raised if unsuccessful.

### GetPageMult

Gets the multiplicity of a CPN page.

#### Synopsis

```
GetPageMult: gid -> int  
exception getPageMult: unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns its multiplicity.

#### Arguments

ID of CPN page.

#### Return value

Multiplicity of CPN page.

#### Exceptions

<code>getPageMult</code>	raised if <code>gid</code> is not a valid CPN page id.
<code>cpndbFail</code>	raised if unsuccessful.

### GetPageInsts

Gets the IDs of CPN page instances.

#### Synopsis

```
GetPageInsts: gid -> dbid list  
exception getPageInsts: unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN page and returns the IDs of its page instances. This function will always return the empty list if invoked within the editor.

#### Arguments

ID of CPN page.

#### Return value

List of page instance IDs of CPN page.

#### Exceptions

<code>getPageInsts</code>	raised if <code>gid</code> is not a valid CPN page id.
<code>cpndbFail</code>	raised if unsuccessful.

### GetPageInstName

Gets the name of a CPN page instance.

#### Synopsis

```
GetPageInstName: dbid -> string  
exception cpndbFail : string
```

#### Description

This function takes a CPN page instance and returns its name. The page instance name describes the path in the page hierarchy by which the page instance is created.

#### Arguments

DBID of CPN page instance.

#### Return value

String containing the name of the CPN page instance.

#### Exceptions

cpndbFail            raised if unsuccessful.

### GetPageInstComp

Gets the ID of a CPN page instance compound node.

#### Synopsis

```
GetPageInstComp: dbid -> id  
exception cpndbFail : string
```

#### Description

This function takes a CPN page instance and returns the ID of its compound node.

#### Arguments

DBID of CPN page.

#### Return value

ID of CPN page instance compound node.

#### Exceptions

cpndbFail            raised if unsuccessful.

### GetMarkingCode

Gets the ML code for accessing the marking of a CPN place on a given CPN page instance.

#### Synopsis

```
GetMarkingCode:  
{placeid : gid, pageinstid : dbid } -> string  
exception getMarkingCode : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN place and a CPN page instance and returns the ML code for accessing the marking. This code can then be used as argument for a usestring, as in the following case:

```
usestring  
["val mark = " ^ GetMarkingCode { instid=pgdbid,  
placeid=plid } "];
```

When this expression is evaluated, the value `mark` contains the string representation of the marking of the place `plid` on the page instance `pgdbid`.

#### Arguments

`placeid` ID of CPN place.  
`pageinstid` DBID of CPN page instance.

#### Return value

String containing the ML code for accessing the marking.

#### Exceptions

`getMarkingCode` raised if `placeid` is not a valid CPN place id.

#### See Also

`GetChangeMarkingCode`.

### GetChangeMarkingCode

Gets the ML code for changing the marking of a CPN place on a given CPN page instance.

#### Synopsis

```
GetChangeMarkingCode:  
{placeid : gid, pageinstid : dbid  
 mark : string} -> string  
exception putMarkingCode : unit  
exception cpndbFail : string
```

#### Description

This function takes a CPN place and a CPN page instance and returns the ML code for changing the marking. This code can then be used as argument for a usestring, as in the following case:

```
usestring  
["val mark = " ^ GetMarkingCode { instid=pgdbid,  
placeid=plid } ];
```

When this expression is evaluated, the place `plid` on the page instance `pgdbid` will have the marking contained in the string representation `mark`.

#### Arguments

`placeid` ID of CPN place.  
`pageinstid` DBID of CPN page instance.  
`mark`.

#### Return value

String containing the ML code for changing the marking.

#### Exceptions

`putMarkingCode` raised if `placeid` is not a valid CPN place id.

#### See Also

`GetMarkingCode`.

