PART 2

Diagram Functions
Introduction to Part 2

Contents of Part 2

Part 2 is divided into the following chapters:

Converting Auxiliary Objects to CPN Objects

Creating CPN Hierarchies

Accessing CPN Diagram Structure

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.
Diagram Functions

**MakeCpnPage**

Converting 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.
Converting Objects to CPN

**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.
Diagram Functions

**MakeTempDec**

Converts an auxiliary node into a CPN temporary declaration.

**Synopsis**

```plaintext
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

\[
\text{MakeLocDec} : \{id : \text{gid}, \text{pageid} : \text{gid}\} \to \text{unit}
\]

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

- id ID of auxiliary node
- pageid ID of CPN page

Return value

None.

Exceptions

- makeLocDec raised if pageid is not a valid CPN page id
- cpndbFail raised if unsuccessful.
Diagram Functions

**MakePlace**

Converts an auxiliary node into a CPN place.

**Synopsis**

```
MakePlace : gid -> unit
exception cpndbPail : 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.
Converting Objects to CPN

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.
Diagram Functions

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.
Converting Objects to CPN

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

cpnnodeid ID of CPN place or transition.
id ID of auxiliary node.

Return value

None.

Exceptions

makeName raised if cpnnodeid is not a valid CPN place or transition id
cpndbFail raised if unsuccessful.
Diagram Functions

**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**

id       ID of auxiliary node.
placeid  ID of CPN place.

**Return value**

None.

**Exceptions**

makeColor raised if placeid is not a valid CPN place id.
cpndbFail raised if unsuccessful.
**MakeInitMark**

Converting an auxiliary node into a CPN initial marking region.

**Synopsis**

```plaintext
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**

- `id` ID of auxiliary node.
- `placeid` ID of CPN place.

**Return value**

None.

**Exceptions**

- `makeInitMark` raised if `placeid` is not a valid CPN place id.
- `cpndbFail` raised if unsuccessful.
Diagram Functions

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

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

Return value

None.

Exceptions

makeGuard raised if transid is not a valid CPN transition id.
cpndbFail raised if unsuccessful.
MakeCodeSeg

Converting 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.
Diagram Functions

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

id ID of auxiliary node.
transid 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.
Diagram Functions

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

arcid ID of CPN arc.
id ID of auxiliary node.

Return value

None.

Exceptions

makeArcExp raised if arcid is not a valid CPN arc id.
cpndbFail 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.
Diagram Functions

**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**

- MakePort raised if id is not a valid CPN place or transition id.
- cpndbFail raised if unsuccessful.

**Related Functions**

MakePlace, MakeTrans, AssignPort.
**MakeOutPort**

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

**Synopsis**

```plaintext
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**

- MakePort raised if id is not a valid CPN place or transition id.
- cpndbFail raised if unsuccessful.

**Related Functions**

MakePlace, MakeTrans, AssignPort.
Diagram Functions

**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**

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

**Related Functions**

MakePlace, MakeTrans, AssignPort.
Creating CPN Hierarchies

**MakeGenPort**

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

**Synopsis**

```plaintext
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**

- **MakePort** raised if id is not a valid CPN place or transition id.
- **cpndbFail** raised if unsuccessful.

**Related Functions**

- MakePlace, MakeTrans, AssignPort.
Diagram Functions

**MakeTransSub**

Converts a CPN transition into a CPN substitution transition.

**Synopsis**

\[
\text{MakeTransSub : (subpageid:gid,transid:gid) -> unit}
\]

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**

- **transid**: ID of transition.
- **subpageid**: ID of CPN page to become the subpage of the substitution transition.

**Return value**

None.

**Exceptions**

- **makeTransSub**: raised if transid is not a valid CPN transition id or if subpageid is not a valid CPN page id.
- **cpndbFail**: 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

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of CPN compound node.</td>
</tr>
<tr>
<td>port</td>
<td>ID of CPN port node</td>
</tr>
<tr>
<td>socket</td>
<td>ID of CPN socket node.</td>
</tr>
</tbody>
</table>

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.
Diagram Functions

**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**

Creating CPN Hierarchies

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.

Related Functions

Diagram Functions

**MakeInstPlaceFus**

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

**Synopsis**

```plaintext
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**

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.
Diagram Functions

**AddToPagePlaceFus**

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

**Synopsis**

\[
\text{AddToPagePlaceFus} : \\
\{\text{name:string, pageid:gid, placeid:gid}\} \rightarrow \text{unit} \\
\text{exception AddToFus : unit} \\
\text{exception cpndbFail : string}
\]

**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

AddToGlobalTransFus

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

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.
Diagram Functions

**IsGlobalPlaceFus**

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

**Synopsis**

\[
\text{IsGlobalPlaceFus : string \to bool} \\
\text{exception cpndbFail : string}
\]

**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.
Diagram Functions

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.
Accessing Diagram Structure

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.
Diagram Functions

**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**

- `getNameText` raised if gid is not a valid place or transition id.
- `cpndbFail` raised if unsuccessful.

**Related Functions**

MakePlace, MakeTrans.
Accessing Diagram Structure

**GetName**

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

**Synopsis**

\[ \text{GetName : gid} \rightarrow \text{gid} \]

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.
Diagram Functions

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

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

Related Functions

MakeColor.


Accessing Diagram Structure

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

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

Related Functions

MakeInitMark.
**Diagram Functions**

**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.
Accessing Diagram Structure

**GetTime**

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

**Synopsis**

\[
\text{GetTime} : \text{gid} \rightarrow \text{gid}
\]

\[
\text{exception getTime : unit}
\]

\[
\text{exception cpndbFail : string}
\]

**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.
Diagram Functions

**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**

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

**Related Functions**

MakeCodeSeg.
Accessing Diagram Structure

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.
Accessing Diagram Structure

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

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

Related Functions

MakeGlobalPlaceFusion, MakePagePlaceFusion,
MakeInstPlaceFusion, MakeGlobalTransFusion,
MakePageTransFusion, MakeInstTransFusion.
Diagram Functions

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.
Diagram Functions

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.
Obtaining Simulation Information

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.
Diagram Functions

IsPageObs

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

Synopsis

IsPageObs : 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.
Obtaining Simulation Information

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.
Diagram Functions

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.
Obtaining Simulation Information

GetPageModeAttr

Gets the simulation mode attributes for a CPN page.

Synopsis

GetPageModeAttr : gid ->
{auto : bool , code : bool , included : bool ,
 observ : bool , proposed : bool}

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.
Diagram Functions

**IsSubTransIncluded**

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

**Synopsis**

```plaintext
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.
Obtaining Simulation Information

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.
Diagram Functions

**IsSubTransObserve**

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

**Synopsis**

\[
\text{IsSubTransObserve : gid} \to \text{bool}
\]

exception \text{SubTransModeAttr} : unit

exception \text{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.
Obtaining Simulation Information

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.
Diagram Functions

**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.
Obtaining Simulation Information

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

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto</td>
<td>TRUE if the subpage of the CPN substitution transition participates in the automatic run for the current simulation, FALSE otherwise.</td>
</tr>
<tr>
<td>code</td>
<td>TRUE if the transitions on the subpage of the CPN substitution transition are executed with code segments for the current simulation, FALSE otherwise.</td>
</tr>
<tr>
<td>included</td>
<td>TRUE if the subpage of the CPN substitution transition is included in the current simulation, FALSE otherwise.</td>
</tr>
<tr>
<td>observ</td>
<td>TRUE if the subpage of the CPN substitution transition is observable in the current simulation, FALSE otherwise.</td>
</tr>
<tr>
<td>proposed</td>
<td>TRUE if the subpage of the CPN substitution transition participates in the occurrence set calculation for the current simulation, FALSE otherwise.</td>
</tr>
</tbody>
</table>

Exceptions

<table>
<thead>
<tr>
<th>Exception</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubTransModeAttr</td>
<td>raised if gid is not a valid CPN substitution transition id.</td>
</tr>
<tr>
<td>cpndbFail</td>
<td>raised if unsuccessful.</td>
</tr>
</tbody>
</table>
Diagram Functions

**IsPagePrime**

Verifies if a CPN page is a prime page.

**Synopsis**

```plaintext
IsPagePrime : 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.
Obtaining Simulation Information

**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**

getPageMult raised if gid is not a valid CPN page id.

cpndbFail raised if unsuccessful.
Diagram Functions

**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**

getPageInsts raised if gid is not a valid CPN page id.
cpndbFail raised if unsuccessful.
Obtaining Simulation Information

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.
Diagram Functions

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.
Obtaining Simulation Information

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 \texttt{plid} on the page instance \texttt{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.
Diagram Functions

**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.