

NodeMaster

COLLABORATORS

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| | <i>TITLE :</i> NodeMaster | | |
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Chapter 1

NodeMaster

1.1 Amiga-E : NodeMaster

** NodeMaster - Original By Fabio Rotondo **

** This Object is part of the Amiga Foundation Classes **

** DOCUMENTATION GUIDE **

Introduction

Author Info

History

Amiga Foundation Classes

Requires: resourceTracker

Base: \$0001

COMMANDS

BRIEF DESCRIPTION

| | |
|-------------------------------|------------------------------------|
| nodemaster(resTracker=NIL) | Initializes the NodeMaster object |
| add(object, mode=NM_ADD_TAIL) | Add object to the list |
| addr() | Get the pointer to the Exec list |
| change(object) | Change current node object |
| changenum(newnum) | Change current node ordinal number |
| changepos(node) | Change current node position |

```
clear()
  Clear ALL list

clearstack()
  Clears all push()ed items

clone()
  Clones the current object

del()
  Delete the current node

empty()
  Check if there are nodes in list

error()
  Returns last error code

first()
  Jump to the first node

get()
  Get the pointer to the current node

insert(object)
  Insert an object AFTER the current one

isfirst()
  Checks if the current item is the first

islast()
  Checks if the current item is the last

item(numitem)
  Jump to the specific item

last()
  Jump to the last node

obj()
  Get the PTR of the current object

numitems()
  Return number of nodes in memory

numpos()
  Returns current ordinal position

pop(pos=TRUE)
  Get a node from the stack

prev()
  Go to the previous node

push()
  Push a node on the stack
```

```
sort(sortroutine, info=NIL)
    Sort a list of items

succ()
    Go to the next node

version()
    Returns class version AND revision

Error Table
```

1.2 Author(s) Info

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----- ↔

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1.3 History

Legend: NEW - New feature

ADV - Advanced feature

FIX - Bug fix

- V3.50 - NEW: Added resourceTracker support.
 - NEW: Added
 clone()
 method.
- V3.40 - NEW: Added error() method.
 - NEW: Added isFirst() method.
 - NEW: Added islast() method.
- V3.30 - FIX: Fixed a minor bug in the clear() method.
 - ADV: Clear routine optimized.
 - ADV: Better docs.
 - NEW: Added islast() method.
 - NEW: Added isFirst() method.
 - NEW: Added version() method.
 - ADV: List constructors are INSIDE NodeMaster source for better porting.
- V3.20 - ADV: Optimized code.
 - ADV: Now nodemaster() calls clearstack() instead of freeing stack's memory ↔
 by itself.
 - ADV: Now clear() calls clearstack() instead of freeing stack's memory by ↔
 itself.
 - ADV: clearstack() is faster.
 - ADV: add() now is faster (and shorter!)
 - ADV: removed all internal self.empty() calls and replaced with the (faster ↔
)
 IsListEmpty() macro.
 - ADV: Now item() patches positions <0
- V3.10 - ADV: clear() modified: now the LIST IS correctly initialized.
 - FIX: now frees the LIST pointer correctly.
- V3.00 - ADV: General Optimizations
 - ADV: Now first(), prev(), succ(), last(), change(), item(), insert(), add ↔
 ()
 return the item address (instead of TRUE) and FALSE when there are
 no more items.
 - ADV: Now stacked push() and pop() have 8 stack levels!!
 - ADV: Now pop() has an optional parameter (pos=TRUE): set it to FALSE if
 you want just to free a stacked push()
 - NEW: method clearstack() to free all push()ed positions.
 - FIX: empty() used to crash when used after a del() with no items.
 - NEW: sort() method. Incredibly fast and general-purpose sort algo
 written by Andrea Galimberti.
 - ADV: optimized prev() and succ() methods. Now about 20% faster.
 - ADV: changepos() modified: now checks agains no items, and return the
 data inside the item or NIL.
 - ADV: del() modified: now returns the pointer to the data inside the
 next active node.
-

- FIX: pos() has been renamed numpos()
- FIX: now SN_ADD_TAIL, SN_ADD_HERE, SN_ADD_HEAD are called:
NM_ADD_TAIL, NM_ADD_HERE, NM_ADD_HEAD (short: change the SN_
with NM_)
- ADV: change() method is now smarter and returns PTR TO obj data or
FALSE.
- ADV: better docs and examples.

1.4 Introduction

INTRODUCTION

NodeMaster is a generic object handling module which will allow you to easily create lists of whatever you want. Its generic structure is ideal for polymorphism and inheritance in other objects. This object just take care of creating Exec Lists and Nodes of something you pass to it (we will call it "object") and then it has great power in Lists manipulation. You can easily add/del nodes from the list, go to a specific item by its ordinal number and so on...

I have worked out this module structuring it on Amiga Exec's Nodes. This means that everything you will add/remove to a NodeMaster will be done on a System List Node.

This code is very Exec List-based, so you can do whatever you want.

Main features are:

- * Push/Pop commands to save/restore a special node position.
- * Insert command to add a object AFTER another (usually it is added as Last node)
- * Item command to go to a specific item by its ordinal number.

NEW V2.0 Version features:

- * New method pos() which returns the actual ordinal node position!
- * Enhanced item() method: now it does not scans from first() item to selected, but just +/- delta objects from the starting point.
- * Internal sniff-snuff ;)
- * NO MORE ENFORCER'S HITS! ;)
- * Returns Raise() errors instead of return codes!!
- * More examples!

NEW V2.10 Version features:

- * New changenum() method to force NodeMaster to change the internal ordinal number of current node.
-

* More code sniff-snuff ;)

NEW V3.00 Version features:

* General improvements in speed.

* NEW! Low-Level tree-algo sort (FAST!!)

* Now push() and pop() has 8 levels of stack!!!

* Now NodeMaster is part of the Amiga Foundation Classes

1.5 NodeMaster / Error Table

| ERROR VALUE | DESCRIPTION |
|-------------|-------------|
| \$0000 | No Memory |

1.6 Amiga Foundation Classes: NodeMaster/NodeMaster()

NAME: NodeMaster(resTracker=NIL : PTR TO resourceTracker)

SYNOPSIS: nodemaster(resourceTracker * resTracker)

DESCRIPTION: Use this command to initialize a NodeMaster object.

INPUT: resTracker - (Optional) Pointer to the Resource Tracker.

RESULTS: NONE.

SEE ALSO:

1.7 Amiga Foundation Classes: NodeMaster/add()

NAME: add(object:PTR TO LONG, mode=SN_ADD_TAIL)

SYNOPSIS: APTR add(APTR s, ULONG mode = NM_ADD_TAIL)

DESCRIPTION: Use this command to add an object to the list.

INPUT: object - PTR TO LONG. This is the object to add.
 mode - (OPTIONAL) This flag is very useful to choose where a new node will be added. Default is as last one, but you can add it as the first line or in the middle of the list (same as insert() command).

Possible values are:

NM_ADD_HEAD - Use this one to add the node

as the first in list.

NM_ADD_HERE - Use this one to add the node
AFTER the current one.
(Same as insert() method)

NM_ADD_TAIL - (Default) Use this one to add
the node as the last in list.

RESULTS: PTR TO obj - PTR TO add()ed obj: everything went fine.

Raise() - An exception in case of problems.

NOTE: Starting from V3.00, NodeMaster will return the PTR TO obj
you have just add()ed, if successfull.

Note also that constants SN_ADD_* are now called NM_ADD_*.

Please, be careful and *NOT* use NM_ADD_HERE if you do not
know for sure that your list is not empty: empty list can
cause problems. If you want to do things in a safe way
use the insert() method, instead of add().

SEE ALSO:

insert()

del()

item()

1.8 Amiga Foundation Classes: NodeMaster/get()

NAME: get()

SYNOPSIS: Node *get(void)

DESCRIPTION: Use this command to get a pointer to the current Exec List
node.

INPUT: NONE.

RESULTS: A PTR TO ln (An Exec List Node)

SEE ALSO:

addr()

1.9 Amiga Foundation Classes: NodeMaster/addr()

NAME: addr()

SYNOPSIS: List *addr(void)

DESCRIPTION: Use this command to get the addr of the Exec List.

INPUT: NONE.

RESULTS: A PTR TO lh (an Exec List Header).

NOTE: This command is useful especially with ListView gadgets which requires a PTR TO an Exec List Header. All you have to do is:

```
Gt_SetGadgetAttrsA(listgad, win, req,  
    [GTLV_LABELS, NodeMasterobj.addr(), 0,0])
```

And the ListView will show your new list.
Please refer to RMKM and autodocs for more infos regarding Gadtools and ListViews.

SEE ALSO:

get()

1.10 Amiga Foundation Classes: NodeMaster/push()

NAME: push()

SYNOPSIS: BOOL push(void);

DESCRIPTION: Use this command to memorize the current node position.

INPUT: NONE.

RESULTS: TRUE - push()ing successful.

FALSE - push()ing failed (out of stack space, or no items)

NOTE: * From V2.00 it does not restore the internal ordinal number.
See
item()
for a better
explanation.

* Starting from V3.00 now push() and pop() have 8 stack levels.

SEE ALSO:

pop()

first()

last()

changeupos()

changenum()

1.11 Amiga Foundation Classes: NodeMaster/pop()

NAME: pop(pos=TRUE)

SYNOPSIS: APTR pop(BOOL autopos = TRUE)

DESCRIPTION: Use this command to restore current node to the one previously Push()ed.

INPUT: pos - (default TRUE) this is a boolean flag.

TRUE, restores the previously push()ed node in list.

FALSE, just removes the push()ed node from the stack.

RESULTS: PTR TO obj - if pop() succeeded and pos=TRUE.

FALSE - not pop()ed or pos=FALSE.

NOTE: * If no node was Push()ed the current node won't change.

* From V2.00 it does not restore the internal ordinal number.

See

item()

for a better

explanation.

* Starting from V3.00, push() and pop() have 8 stack levels.

SEE ALSO:

push()

changeupos()

changenum()

1.12 Amiga Foundation Classes: NodeMaster/obj()

NAME: obj()

SYNOPSIS: APTR obj(void);

DESCRIPTION: Use this command to get the current node's PTR TO object.

INPUT: NONE.

RESULTS: PTR TO obj data to the current node object.

SEE ALSO:

add()

1.13 Amiga Foundation Classes: NodeMaster/del()

NAME: del()

SYNOPSIS: APTR del(void)

DESCRIPTION: Use this command to delete the current node.
After deletion the CURRENT NODE will be the next one.
If the node you deleted was the last one, then the next
will be the previous one.

INPUT: NONE.

RESULTS: PTR TO next obj data. Starting from V3.00 del() method
returns the pointer to the next actual obj data, or NIL
if it was the last object available in list (ie. list empty)

SEE ALSO:

clear()

add()

1.14 Amiga Foundation Classes: NodeMaster/clearstack()

NAME: clearstack()

SYNOPSIS: void clearstack(void)

DESCRIPTION: Use this method to clear all push()ed nodes in stack.

INPUT: NONE.

RESULTS: push() stack will be cleared.

SEE ALSO:

push()

pop()

1.15 Amiga Foundation Classes: NodeMaster/numitems

NAME: numitems()

SYNOPSIS: ULONG numitems(void)

DESCRIPTION: Use this command to know how many items are added to the
list.

INPUT: NONE.

RESULTS: items - LONG. Number of items.

SEE ALSO:

add()

del()

1.16 Amiga Foundation Classes: NodeMaster/empty()

NAME: empty()

SYNOPSIS: BOOL empty(void)

DESCRIPTION: Use this command to check whether the list is empty or not.

INPUT: NONE.

RESULTS: TRUE - List is empty
 FALSE - At least one item is present.

SEE ALSO:

1.17 Amiga Foundation Classes: NodeMaster/first()

NAME: first()

SYNOPSIS: APTR first(void)

DESCRIPTION: Use this command to jump to the first object in the list.

INPUT: NONE.

RESULTS: PTR TO first obj - Position correct.
 FALSE - Cannot go to the first (maybe list empty).

NOTE: Before V3.00 first() used to return TRUE when positioning correctly to the first item, now it returns directly the obj data, so you don't have to call the "obj()" method.

SEE ALSO:

last()

del()

obj()

1.18 Amiga Foundation Classes: NodeMaster/last()

NAME: last()

SYNOPSIS: APTR last(void)

DESCRIPTION: Use this command to position current node to the last one.

INPUT: NONE.

RESULTS: PTR TO obj data - Operation successfull.

FALSE - No items.

NOTE: V3.00 - Now last() returns directly the obj data, so you do not have to do a "obj()" anymore.

SEE ALSO:

first()

item()

1.19 Amiga Foundation Classes: NodeMaster/succ()

NAME: succ()

SYNOPSIS: APTR succ(void)

DESCRIPTION: Use this command to position current node to the next one in list.

INPUT: NONE.

RESULTS: PTR TO obj - PTR TO obj data: positioning successful.
FALSE - No next items.

NOTE: It is a structural problem linked TO this method. If you add to NodeMaster some numbers (eg. 1, 2, 3, 4, ..., n) the class could give you a wrong result, when it encounters a number "0", because it will return a "0" and you could assume that it is a FALSE (no next items) value. You should check using the islast() method.

SEE ALSO:

prev()

islast()

last()

1.20 Amiga Foundation Classes: NodeMaster/prev()

NAME: prev()

SYNOPSIS: APTR prev(void)

DESCRIPTION: Use this command to go to the previous string in the list.

INPUT: NONE.

RESULTS: PTR TO obj - PTR TO obj data: positioning successful.
FALSE - No previous items.

NOTE: see note in
succ()

SEE ALSO:

succ()

first()

last()

1.21 Amiga Foundation Classes: NodeMaster/insert()

NAME: insert(object:PTR TO LONG)

SYNOPSIS: APTR insert(APTR s)

DESCRIPTION: Use this command to add an object AFTER the current node.

INPUT: object - PTR TO CHAR. Object you want to add.

RESULTS: PTR TO object data.

NOTE: The current node WILL NOT change!!!

SEE ALSO:

add()

del()

item()

1.22 Amiga Foundation Classes: NodeMaster/item()

NAME: item(numitem)

SYNOPSIS: APTR item(ULONG n)

DESCRIPTION: Use this command to position current node to the ordinal
numitem node.

INPUT: numitem - LONG. Ordinal value of node position.

RESULTS: PTR TO obj data - Position correct.

FALSE - List is empty.

NOTES: V3.00 - Now this method() returns directly obj data when called successfully, so you don't have to do an obj() anymore.

From V2.00 this method changes a bit. Now it scans prev() or succ() item starting from the current position. So it is faster, but you have to be careful.

If you use the method changepos(), the internal ordinal position is not changed. So you have to do a first() method before calling item().

In any case, if you think that something in your source could behaves differently, just do a first() method call and everything will behaves as always.

Also pop() and push() do not update internal ordinal position. Do a first() also before an item() after them.

SEE ALSO:

numitems()

changepos()

changenum()

1.23 Amiga Foundation Classes: NodeMaster/change()

NAME: change(data:PTR TO LONG)

SYNOPSIS: PTR change(APTR s)

DESCRIPTION: Use this command to change the PTR to the data field of current object.

INPUT: data - PTR TO LONG. New data to change the old one with.

RESULTS: PTR TO obj data - Changin successful.

FALSE - No change (maybe list empty)

SEE ALSO:

1.24 Amiga Foundation Classes: NodeMaster/clear()

NAME: clear()

SYNOPSIS: BOOL clear(void)

DESCRIPTION: Use this command to clear all items in the list.

INPUT: NONE.

RESULTS: The list will be completely empty.

SEE ALSO:

del()

1.25 Amiga Foundation Classes: NodeMaster/changepos()

NAME: changepos(node:PTR TO ln)

SYNOPSIS: APTR cngepos(Node *node)

DESCRIPTION: Use this command to change current node position to another.

INPUT: node - (PTR TO ln) new list node to change position to.

NOTE: You *MUST* know exactly what you are doing. Passing a wrong node as parameter could get to Software Failures and so on. This command is designed only for "professional" user who intend build new object inheriting this one.

From V2.00 note also that it does not update internal ordinal number. See

item()

RESULTS: The current node position will be changed.

SEE ALSO:

first()

last()

item()

1.26 Amiga Foundation Classes: NodeMaster/pos()

NAME: numpos()

SYNOPSIS: LONG numpos(void)

DESCRIPTION: Use this command to know the ordinal object position inside the list.

INPUT: NONE.

RESULTS: The current ordinal node position is returned.

SEE ALSO:

first()

last()

item()

1.27 Amiga Foundation Classes: NodeMaster/changenum()

NAME: changenum(newval)

SYNOPSIS: void chaenum(ULONG newnum)

DESCRIPTION: Use this command to change current node ordinal position number.

INPUT: newval - (LONG) new ordinal number to assign to the current node.

NOTE: You *MUST* know exactly what you are doing. Passing a wrong value as parameter could get to Software Failures and so on. This command is designed only for "professional" user who intend build new object inheriting this one.

RESULTS: The current node ordinal number will be changed.

SEE ALSO:

first()

last()

item()

changeupos()

1.28 Amiga Foundation Classes: NodeMaster/sort()

NAME: sort(sortingroutine, info=NIL:PTR TO LONG)

SYNOPSIS: APTR sort(LONG (*comp) (APTR, APTR, APTR APTR info = NULL)

DESCRIPTION: Use this method to sort the list.

INPUT: sortingroutine - You MUST provide a comparison routine, which will be used to sort your list. The comp routine should accept three params: item1, item2 and info. Item1 and item2 are the two items you should compare; while info is an optional param containing to whatever you want. Your comp routine MUST return a value:

>1 - Item1 > Item2

=0 - Item1 = Item2

<0 - Item1 < Item2

Then items will be sorted accordingly by the sort() method.

info - (DEFAULT NIL) This is an optional param

that will be passed to your comp routine.
It can contain everything you like.

RESULTS: PTR TO first obj data - list has been sorted.

FALSE - sort() failed (maybe list empty)

NOTE: After a sort():

+ Stack will be cleared.
+ Current item will be the first one.

SEE ALSO:

push()

pop()

clearstack()

first()

1.29 Amiga Foundation Classes: NodeMaster/version()

NAME: version()

SYNOPSIS: ULONG version(BOOL rev = FALSE)

DESCRIPTION: Returns class version and revision.

INPUT: NONE

RESULTS: This method returns TWO values: class version and revision.

PORTING NOTES: Because in C++ a function cannot return two values, we have arranged the version/revision return values in this way:
by calling version() method with rev=FALSE you will be returned the Class VERSION. If you set rev=TRUE, then you'll get the Class REVISION.

SEE ALSO:

1.30 Amiga Foundation Classes: NodeMaster/islast()

NAME: islast()

SYNOPSIS: BOOL islast(void)

DESCRIPTION: This method checks if the current item is the last one.

INPUT: NONE.

RESULTS: TRUE - The item is the last.

FALSE - The item is not the last.

SEE ALSO:

isfirst()

1.31 Amiga Foundation Classes: NodeMaster/isfirst()

NAME: isfirst()

SYNOPSIS: BOOL isfirst(void)

DESCRIPTION: This method checks if the current item is the first one.

INPUT: NONE.

RESULTS: TRUE - The item is the first.
FALSE - The item is not the first.

SEE ALSO:

islast()

1.32 Amiga Foundation Classes: NodeMaster/error()

NAME: error()

SYNOPSIS: ULONG error(void)

DESCRIPTION: This method checks if the current item is the first one.

INPUT: NONE.

RESULTS: last error code. 0 means "no errors".

SEE ALSO:

1.33 Amiga Foundation Classes: NodeMaster/clone()

NAME: clone()

SYNOPSIS: Nodemaster * clone(VOID)

DESCRIPTION: This method clones the current nodemaster and its contents and returns a new (cloned) NodeMaster object.

INPUT: NONE.

RESULTS: a PTR to a valid NodeMaster class. May be NIL.

NOTE: - The cloned class resulting from this method should be considered a NodeMaster class in all of its parts.

So, you are supposed to END (delete) the class by yourself, when you have finished with it.

- The Resource Tracker used by the "original" class is provided to the cloned one during creation.

SEE ALSO: `resourceTracker`
