Subject: MCR10103, Move help-related programs to bound_help_

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Ticket: https://multics-trac.swenson.org/ticket/262

Changes being considered for info_seg_.pl1 (the subroutine interface for parsing and processing of info segments) will cause that segment to grow in size. It is now known that enlarging info_seg_.pl1 will cause its container (bound_info_rtns_.s.archive) to overflow the 255 page limit for Multics segments. [bound_info_rtns_.s.archive records used = 253]

To resolve that problem, this MCR proposes to create a new bound_help_ object segment which will contain all commands relating to .info segments, plus help_ and info_seg_ subsystems and their support routines.

Proposed Changes

Move check_info_segs, help, list_help, and verify_info commands to bound_help_. Move help_ and info_seg_, plus their supporting routines to bound_help_. The components in bound_info_rtns_.s.archive relating to info segments are starred in the list below.

```
archive_table [lpn bound_info_rtns_.s.archive]
 *  check_info_segs.pl1
 *  help.pl1
 *  help_.pl1
 *  help_listen_util_.pl1
 *  help_request_tables_.alm
 *  help_requests_.pl1
 *  help_responses_.pl1
 *  help_util_.pl1
 *  info_seg_.pl1
 *  info_seg_allocate_.pl1
 *  info_seg_error_.pl1
 *  info_seg_parse_.pl1
 *  info_seg_specifications_.cds
 *  info_seg_util_.pl1
 *  info_seg_verify_.pl1
 *  info_seg_verify_iFile_.pl1
 *  list_help.pl1
    list_ref_names.pl1
    print_motd.pl1
    resource_usage.pl1
    ring0_get_.pl1
    system_info_.pl1
    user_info_.pl1
 *  verify_info.pl1
    where.pl1
    who.pl1
```

All of the starred source components will be deleted from the bound_info_rtns_ object segment, and added to the new bound_help_ object segment.

Proposed are the following steps:

- Use library_fetch to get a copy the current source archive. For example:
  lf bound_info_rtns_.s.archive
- Extract and delete from bound_info_rtns_.s.archive the components to be moved to the new bound object. For example, using archive (ac) command and archive_table (act) active function, extract/delete all components with names beginning with: c, h, i, list_h or v.
  ac xd bound_info_rtns_.s [act bound_info_rtns_.s (c h i list_h v)*.*]
- Append those components to a new bound_help_.s.archive.
  ac ad bound_help_.s [segs (c h i l v)*.*]
- Use library_fetch to get the bind file for the bound_info_rtns_ segment. The bind file is the only component of the object archives not generated by source in the source archives. This bind file is needed in the installation directory so the developer can manually divide its contents into:
  - descriptions in bound_info_rtns_.bind for components remaining in bound_info_rtns_;
  - descriptions in bound_help_.bind for components moved to bound_help_.

  library_fetch searches only source libraries by default; so tell it to look instead in object (o) libraries.
  lf -lb o bound_info_rtns_.bind

  Copy bound_info_rtns_.bind to bound_help_.bind. Then edit each bind file to remove descriptions of components no longer part of that bound object.

The mbuild script for this change involves deleting components from the original bound_info_rtns_ object segment and replacing its bind file; then adding a new bound_help_ object segment. The blue lines in this script identify archive components mbuild found in the new bound_help_.s.archive being added; they do not appear in the original install script.

```
Description:
 1) Move all help-related commands and subroutines out of bound_info_rtns_ and
    into a new bound_help_ object segment.

Installation_directory:  >udd>m>gd>w>bh;

 Build_script:   bh.mb;

 Bound_obj:      bound_help_                      IN: sss  ADD;
     bindfile:   bound_help_.bind                  ADD;
   source_arch:  bound_help_.s.archive             ADD;
     source:     check_info_segs.pl1               ADD  compiler: pl1 -ot;
     source:     help.pl1                          ADD  compiler: pl1 -ot;
     source:     help_.pl1                         ADD  compiler: pl1 -ot;
     source:     help_listen_util_.pl1             ADD  compiler: pl1 -ot;
     source:     help_request_tables_.alm          ADD  compiler: alm;
     source:     help_requests_.pl1                ADD  compiler: pl1 -ot;
     source:     help_responses_.pl1               ADD  compiler: pl1 -ot;
     source:     help_util_.pl1                    ADD  compiler: pl1 -ot;
     source:     info_seg_.pl1                     ADD  compiler: pl1 -ot;
     source:     info_seg_allocate_.pl1            ADD  compiler: pl1 -ot;
     source:     info_seg_error_.pl1               ADD  compiler: pl1 -ot;
     source:     info_seg_parse_.pl1               ADD  compiler: pl1 -ot;
```

```
     source:     info_seg_specifications_.cds       ADD  compiler: cds;
     source:     info_seg_util_.pl1                 ADD  compiler: pl1 -ot;
     source:     info_seg_verify_.pl1               ADD  compiler: pl1 -ot;
     source:     info_seg_verify_iFile_.pl1         ADD  compiler: pl1 -ot;
     source:     list_help.pl1                      ADD  compiler: pl1 -ot;
     source:     verify_info.pl1                    ADD  compiler: pl1 -ot;

Bound_obj:       bound_info_rtns_                  IN: sss  UPDATE;
     bindfile:   bound_info_rtns_.bind              REPLACE;
     source:     check_info_segs.pl1                DELETE;
     source:     help.pl1                           DELETE;
     source:     help_.pl1                          DELETE;
     source:     help_listen_util_.pl1              DELETE;
     source:     help_request_tables_.alm           DELETE;
     source:     help_requests_.pl1                 DELETE;
     source:     help_responses_.pl1                DELETE;
     source:     help_util_.pl1                     DELETE;
     source:     info_seg_.pl1                      DELETE;
     source:     info_seg_allocate_.pl1             DELETE;
     source:     info_seg_error_.pl1                DELETE;
     source:     info_seg_parse_.pl1                DELETE;
     source:     info_seg_specifications_.cds       DELETE;
     source:     info_seg_util_.pl1                 DELETE;
     source:     info_seg_verify_.pl1               DELETE;
     source:     info_seg_verify_iFile_.pl1         DELETE;
     source:     list_help.pl1                      DELETE;
     source:     verify_info.pl1                    DELETE;
```

Testing

Since none of the source modules are being changed, testing focused on changes to the bind files to ensure that the smaller bound_info_rtns_ binds correctly and retains the proper names and entry points. Similarly, the new bound_help_ should have all the appropriate names and entry points retained. No bind errors should be reported.

Results of this testing found all segment names and entry points of the original >sss>bound_info_rtns_ were preserved in the smaller bound_info_rtns_ and new bound_help_. [bound_help_.s.archive records used = 222]

Results of this restructuring uncovered several problems in how the mbuild system handles the above build script. MCR10102 addresses these problems. The revised mbuild encountered no problems in compiling, archiving, binding or preparing an install exec_com for the two bound segments.

Documentation

Since no user source modules are changing, no documentation changes are included in this change proposal.

Version History

Date	Revision	Author	Comment
2021-11-24	1.0	Gary Dixon	Initial draft of this MCR.