HSI/HTAR Build and Installation

Hierarchical Storage Interface, Version 9.2, 26 February 2021

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Chapter 1. Overview

The general steps for building and installing the HSI-HTAR interface are similar to other software packages. They are as follows and provide the general organization of this document:

1. Obtain HSI-HTAR source tree
2. Run `./Configure` (see Appendix A)
3. Perform installation of server and client

Chapter 2. HSI-HTAR Source Tree

The source code for the HSI-HTAR client can be obtained from HPSS Admin Wiki as a tarball:

```
https://hpss-collaboration.clearlake.ibm.com/adminwiki/doku.php?id=start
```

Select the "docs" folder then select the "tar_file" folder. Select the appropriate HSI-HTAR release from the list.

```
NOTE: HSI-HTAR 6.3_U2 is compatible with HPSS 7.5.3.
      All following HSI-HTAR versions will match the HPSS version
      that it is compatible with.
```

The following command shows how to unpack the first tarball.

```
tar -xvzf <hsi version #> X.X.tar
```

The tarball will further unpack into two gzip compressed files:

```
Server:  hsihtarsrvr.<hsi version #>.tar.gz (previously X.X.hsigwd.tar.gz)
Client:  hsihtarclnt.<hsi version #>.tar.gz (previously X.X.tar.gz)
```

The hsihtarclnt.tar.gz file can be installed separately on the client. To get a complete source tree, uncompress hsihtarclnt.tar.gz, and then hsihtarsrvr.tar.gz.

For HSI-HTAR version 9.X and later, the resulting source tree should look similar to the one below.

```
drwxrwx---  2 root hpss   4096 Jun 25 10:47 api_extensions
drwxrwx---  2 root hpss     29 Jun 25 10:22 code_templates
-rwxr-x---  1 root hpss  58258 Jun 25 10:22 Compile
drwxrwxr-x  3 root hpss    101 Jun 25 10:47 config
-rwxr-x---  1 root hpss 298633 Jun 25 10:22 Configure
drwxrwx---  7 root hpss     82 Jun 25 10:22 hsi
drwxrwx---  5 root hpss     43 Jun 25 10:22 htar
drwxrwx---  2 root hpss   4096 Jun 25 10:22 include
drwxrwx---  2 root hpss     73 Jun 25 10:47 lib
-rw-r-----  1 root hpss   9969 Jun 25 10:22 Makefile
drwxrwx---  4 root hpss     41 Jun 25 10:22 misc
drwxrwx--- 10 root hpss    149 Jun 25 10:22 ndapi
-rw-r-----  1 root hpss   2662 Jun 25 10:22 version
```

For hsihtar 6.3, the resulting source tree should look similar to the one below.

```
lrwxrwxrwx 1 root hpss     21 Nov  9 17:20 api_extensions -> api_extensions.6.3.0/
drwxr-xr-x 1 root hpss    936 Nov  9 17:20 api_extensions.6.3.0
drwxr-xr-x 1 root hpss     30 Nov  9 17:20 code_templates
-rwxr-xr-x 1 root hpss  57430 Jun 10  2019 Compile
drwxr-xr-x 1 root hpss     54 Nov  9 17:20 config
-rwxr-xr-x 1 root hpss 298396 Jun 10  2019 Configure
lrwxrwxrwx 1 root hpss     10 Nov  9 17:20 hsi -> hsi.6.3.0/
drwxr-xr-x 1 root hpss     66 Nov  9 17:20 hsi.6.3.0
lrwxrwxrwx 1 root hpss     11 Nov  9 17:20 htar -> htar.6.3.0/
drwxr-xr-x 1 root hpss     26 Nov  9 17:20 htar.6.3.0
drwxr-xr-x 1 root hpss    790 Nov  9 17:20 include
drwxr-xr-x 1 root hpss     12 Nov  9 17:20 lib
-rw-r--r-- 1 root hpss   8864 Jun 10  2019 Makefile
drwxr-xr-x 1 root hpss     38 Nov  9 17:20 misc
```

```
lrwxrwxrwx 1 root hpss     11 Nov  9 17:20 ndapi -> ndapi.6.3.0
drwxr-xr-x 1 root hpss    142 Nov  9 17:20 ndapi.6.3.0
```

Refer to the HSI-HTAR 9.2 Release Notes for prerequisites and packages supported and required to build and install HSI-HTAR.

Proceed to the next two chapters if you plan to build and install HSI-HTAR server components. However, if you are only interested HSI-HTAR client components, skip to the Client Build Configuration chapter.

Chapter 3. Server Build Configuration

The server build will need *both* client and server tarballs. Build configuration is primarily done through a Perl script called **Configure**. To run the **Configure** script, change the directory into the HSI_HTAR source tree, and do the following:

```
cd <hsi version #>

./Configure
```

This script will present the user with questions regarding build system configuration options. The questions are grouped into various sections, with section headers that explain the nature of the questions that follow. To cancel out of the **Configure** script use <ctrl-c>.

An example of running this script is given in Appendix A to follow along. The proceeding instructions highlight areas that require special attention or to show differences between a server build versus a client build.

After the welcome screen, a list of configuration choices is presented. For server build, select option 2 (server) or option 3 (both client and server) For purposes of this example, option 3 (both client and server) is used.

```
Would you like to configure the HSI client packages, the server package,
or both?

Enter  1  : to configure just the client
       2  : to configure just the server
       3  : to configure both client and server

Enter selection:  Choose 2 or 3 for a server build configuration
```

The next set of questions deal with configuring encryption/decryption cipher methods. You must choose either the default setting (yes) or at least one of the ciphers to enable authentication: GARBLE, AES, Blowfish, or 3DES cipher.

```
 Default Cipher Method Settings

GARBLE cipher................. enabled
AES cipher.................... enabled
Blowfish cipher............... enabled
3DES cipher................... enabled

Use above settings?  (yes/no) [yes]: Choose default yes or at least one of the
four, GARBLE, AES, Blowfish, or 3DES
```

The next set of questions deal with authentication methods. Note that if a site plans to use the SU/SUDO feature, the COMBO authentication method must be enabled during the Configuring Authentication Method Items step.

```
NOTE:
    If you are planning on using RSA Securid fobs, you must enable
    the COMBO authmethod, below.


Note: Enter "no" below if you would like an explanation of
```

```
    each method, as well as an option to enable/disable it.

You can just enter "yes" at this point to use the default settings.
 Default Authmethod Settings

COMBO authmethod.......... disabled
GLOBUS GSI authmethod..... disabled
IDENT authmethod.......... disabled
KERBEROS authmethod....... disabled
KEYTAB authmethod......... disabled
MUNGE authmethod.......... disabled
PAM authmethod............ disabled

Use above settings?  (yes/no) [yes]: Type "no" to change the settings.
This will cycle through each authmethod and ask if you wish to enable.
```

Choose the settings that make sense for your site. In this example, Kerberos authentication method with kerberos-style keytabs is enabled.

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "KERBEROS" authmethod allows users to automatically authenticate without
requiring a password, after they use the Kerberos "kinit" command to create a
ticket-granting ticket. This method requires the Kerberos package to be
installed.  Both MIT and Heimdal Kerberos as recognized, although Heimdal
Kerberos has not yet been tested.

This method must be enabled in order to enable the "keytab" authentication
method for use with kerberos-style keytabs.  It is _not_ required if you are
planning to enable the "keytab" authentication method just for unix-style
keytabs.

Enable "KERBEROS" authmethod? (yes/no) [yes]: Choose "yes" to enable kerberos

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "KEYTAB" authmethod allows users to authenticate automatically without
requiring a password, after they either use the kerberos <ktutil> or the
<hpss_unix_keytab> program (if using unix authentication) to extract a
"keytab" file containing their encrypted password.
This method requires the Kerberos authmethod to be enabled if using
kerberos-style keytabs.

Enable "KEYTAB" authmethod? (yes/no) [yes]: Type "yes" to enable
```

During the Configuring API Library-Specific Items stage, make sure the NDAPI_SERVER_HOST field is populated with the server host full name. It will be blank for first time through or if the hsi_pkg_includes is deleted under the config directory.

```
++++++++++++++++++++++++++++++++++++++++++++++
     Configuring API Library-Specific Items
++++++++++++++++++++++++++++++++++++++++++++++

In the next screen you will be given the option of changing items that
are specific to the HSI Gateway Client API Library.

Once you have made all the changes that you wish to make (if any),
enter "a" at the prompt to continue.

Press <enter> to continue to the next screen:
If you wish to change an item, enter "c" followed by an optional
```

```
space and the item number, or just the item number.
For example:
    "2" or "c 2" or "c2"

If you would like to get help on an item, enter "h" followed by
an optional space and the number, for example:
    "h 3"     or "h3"

 1 MAX_RESTRICTED_PORT .........65535
 2 MIN_RESTRICTED_PORT .........0
 3 NDAPI_DEFAULT_ADDR_FAMILY ...ipv4_only
 4 NDAPI_DEFAULT_AUTH_TYPE .....PAM,COMBO,KEYTAB,KRB_PREEXIST,KERBEROS
 5 NDAPI_LOCAL_LOGFILE ........./dev/null
 6 NDAPI_SERVER_HOST ...........
 7 NDAPI_SERVER_PORT ...........1217


[a=accept]  [c N] or [N]->change item N  [h N]->help for item N]
Your choice: Type c 6 to add the server full name.
```

Type in the the server host full name when presented with the following prompt:

NDAPI_SERVER_HOST Current setting: [] Enter new setting: (e.g. elayne.clearlake.ibm.com)

Then press "a" to accept.

Once all the configuration prompts have been completed, **Configure** prompts to allow you to go back and make changes by letting you edit the configuration file directly. If you are satisfied with the choices and answers provided, then press *Enter* to accept the default selection of "no".

```
Writing Makefile include file (config/hsi_pkg_includes)

Creating symlink (config/mach_compile_flags) for linux

... Removing existing symlink

Would you like to edit the configuration file? (yes/no) [no]:

Would you like to compile now? (yes/no) [yes]:
```

This indicates that the configuration is done, and the build is beginning.

The build configuration is stored in the following files, after the initial run of **Configure**:
`<hsi version #>/config/hsi_pkg_includes`
`<hsi version #>/config/globus_makefile_defs`

These files constitute the build configuration. They are read on subsequent runs of **Configure**, so that previous answers are retained in config/hsi_pkg_includes file. Once created, these files can be updated manually and used to automate the configuration and build process, if needed.

It is not necessary to run **Configure** and reconfigure the build if a subsequent rebuild is desired. Simply run:

```
usage: Compile [-h] [-a ARCH] [-b BDIR] [-client] [-docs] [-server]
               [-ssl SSLDIR]

Compile -- wrapper to build HSI/HTAR software
```

```
optional arguments:
  -h, --help   show this help message and exit
  -a ARCH      Build Platform Architecture
  -b BDIR      User Build Directory
  -client      Build Client
  -docs        Build Formatted Documentation
  -server      Build Server (hsigwd)
  -ssl SSLDIR  OpenSSL Installation Directory
```

Note: The user build directory must be empty or does not exist in order for the compile to execute.

After a build using the default build directory (no options specified), the server and client executables are located at:

```
<hsi source directory>/bld-<hostname>-<architecture>-<OSversion>/bin/
hpss_hsigwd.<hsi version #>
```

After a build using the default build directory (no options specified), the hsi and htar executables are located at:

```
<hsi source directory>/bld-<hostname>-<architecture>-<OSversion>/bin/hsi
```

```
<hsi source directory>/bld-<hostname>-<architecture>-<OSversion>/bin/htar
```

If the Kerberos authentication was configured, there will be an additional executable called:

```
<hsi source directory>/bld-<hostname>-<architecture>-<OSversion>/bin/
hsigwd_kchild.<hsi version #>
```

If the Globus authentication was configured, there will be an additional executable called:

```
<hsi source directory>/bld-<hostname>-<architecture>-<OSversion>/
hsigwd_gsichild.<hsi version #>
```

Example run of Compile with -b, -server, and -client options:

```
$ ./Compile -b /tmp/hsi_server_client -server -client
```

After a build using the -b, -server, and -client options, the server, hsi, and htar executables are located:

```
/tmp/hsi_serverclient/bin/hpss_hsigwd.9.2.0
```

```
/tmp/hsi_serverclient/bin/hsi
```

```
/tmp/hsi_serverclient/bin/htar
```

Chapter 4. Server Installation

The HSI/HTAR server is invoked via **xinetd**. It needs to run on a machine that has access to an HPSS instance's configuration files, typically found in `/var/hpss/etc`. The machine also has to have runtime access to the HPSS API libraries, typically located in `/opt/hpss/lib`.

The following steps need to be completed in order to run the HSI-HTAR server. Some example commands are given with each step. They typically run as root. Some examples of the various system configuration files needed for a server installation can be found at `<hsi version #>/misc/templates`.

In our example moving forward, soft link paths to the executables will be used and are mapped in the following manner:

```
/opt/hsi -> /hsihtar_src/9.2/bld-elayne-linux_ppc64le-redhat7.9/bin/hssi
/opt/hsigwd -> /hsihtar_src/9.2/bld-elayne-linux_ppc64le-redhat7.9/bin/hpss_hsigwd.9.2.0
```

- Configure the server log. Create the ndapi log directory based on the HSI configuration. The default location of HSIGWD_LOG_DIR is `/var/hpss/ndapi`.

```
cd /hsihtar_src/X.X/config
root@elayne > grep HSIGWD_LOG_DIR hsi_pkg_includes
HSIGWD_LOG_DIR = /var/hpss/ndapi
#If /var/hpss/ndapi does not exist create it
root@elayne > mkdir /var/hpss/ndapi
```

- Modify the syslog utility configuration as needed, and restart the syslog service.

```
If using rsyslog, in /etc/rsyslog.conf, add lines 75, 76, 77, 78

     72 # Save boot messages also to boot.log

     73 local7.*                              /var/log/boot.log

     74

     75 # For hsihtar:

     76 local1.*                              /var/hpss/ndapi/ndapi.log

     77 local2.*                              /var/hpss/ndapi/hgs.log

     78 local3.*                              /var/hpss/ndapi/xferlog

     79

root@elayne > systemctl restart rsyslog.service
```

- Configure `/etc/services` so that `port 1217` exists for the HPSS HSI Gateway. If not, add one line:

```
#Check for port 1217
root@elayne > grep 1217 /etc/services
root@elayne >
#If the grep returns empty or no match then add the following line
root@elayne > vi /etc/services
hpss-ndap    1217/tcp            # HPSS HSI Gateway
```

- Configure the **xinetd** service and restart. Copy the template from HSI/HTAR source tree `<hsi version>/misc/templates/xinetd.d` to `/etc/xinetd.d/<services entry>`. Modify as needed. Make sure the name of the **xinetd** script matches the entry in `/etc/services` (hpss-ndapi):

```
root@elayne > cp /hsihtar_src/9.2/misc/templates/xinetd.d /etc/xinetd.d/hpss-nadi
# Make sure line 14 service matches /etc/services entry of hpss-ndapi
# Revise line 25 to the directory of your hpss_hsigwd.9.2.0 executable
# Review and modify as necessary
root@elayne > cat /etc/xinetd.d/hpss-ndapi
 14 service hpss-ndapi
   15 {
   16    flags           =NODELAY,KEEPALIVE
   17 # --- Uncomment one of the following flags if desired.
   18    flags           += IPv4
   19 #  flags           += IPv6
   20    port            = 1217
   21    protocol        = tcp
   22    socket_type     = stream
   23    wait            = no
   24    user            = root
   25    server          = /opt/hsigwd
   28    log_on_failure  += USERID
   29    disable         = no
   30 # hsigwd settings
   31    umask           = 022
   32    instances       = UNLIMITED
   33    server_args     = -d -f /var/hpss/ndapi/ndapi.log -Pftp -phpssftp -V1mb
   34    per_source      = UNLIMITED
   35
   36 # Add GLOBUS runtime library path (needed for gsichild)
   37 # Note that the path should be set to $GLOBUS_LOCATION/lib, but since
   38 # xinetd doesn't expand environment variables, the actual path must be
   39 # specified.
   40    env   = LD_LIBRARY_PATH=/opt/hpss/lib:/usr/local/globus/globus_2.4.3/lib
   41
   42 # Set the default network family if running the unxserver. This should be
   43 # already set up for the HPSS gateway, either in the compile-time
   44 #  definitions, or in the env.conf file.
   45 #  env             +=HPSS_NET_FAMILY=ipv4_only
   46
   47 # xinetd logging
   48 #  log_type        = FILE /var/hpss/ndapi/xinet.log
   49 #  log_on_success  = PID HOST EXIT DURATION
   50 #  log_on_failure  = HOST ATTEMPT
   51 }
#Restart xinetd.service
root@elayne > systemctl restart xinetd.service
# Check status and make sure it's active
root@elayne > systemctl status xinetd.service
* xinetd.service - Xinetd A Powerful Replacement For Inetd
  Loaded:  loaded (/usr/lib/systemd/system/xinetd.service; enabled;
           vendor preset: enabled)
  Active: active (running) since Fri 2020-06-12 15:06:41 CDT; 6 days ago
  Process: 51763 ExecStart=/usr/sbin/xinetd -stayalive -pidfile
           /var/run/xinetd.pid $EXTRAOPTIONS (code=exited, status=0/SUCCESS)
```

- Copy the HSI `HPSS.conf` template to `/var/hpss/etc` and modify it as needed. Make a copy before appending.

```
cp /var/hpss/etc/HPSS.conf /var/hpss/etc/HPSS.conf.ori
cat <hsi version #>/misc/templates/HPSS.conf.template >> /var/hpss/etc/HPSS.conf
```

For sites using Kerberos authentication, make sure that the Server Auth krb5 is turned on. If a krb5 password is being used, make sure that is also turned on. Likewise, for sites using unix authentication, make sure that the Server Authentication Mechanism unix is turned on. For keytab authentication, select, uncomment, and if necessary edit the pathname. In HPSS.conf, see the following example and remove the ";" to uncomment the configuration lines.

```
850   # Authentication mechanism that server uses to get HPSS creds
851   # Valid settings are "unix" and "krb5"
852   ;Server Authentication Mechanism = unix
853    Server Authentication Mechanism = krb5
854
855   # Authenticator type that server uses to prove its identity
856   # Legal values are auth_none, auth_keytab, auth_keyfile, auth_key, auth_passwd
857   # Currently, the only supported value is "auth_keytab"
858   Server Authenticator Type = auth_keytab
859
860   # Authenticator that server uses to prove its identity.
861   # The value of this flag depends upon the Server Authenticator Type.
862   # For auth_keytab, it is the pathname of the keytab file for the server
863      ;Server Authenticator = /var/hpss/etc/hpss.unix.keytab
864      Server Authenticator = /var/hpss/etc/hpss.keytab
```

- Create the COS list used by HSI, and move it into `/var/hpss/etc`. The `/opt/hpss/bin/lshpss` executable needs to be on the machine that the `make_cos.py` runs on, as that script calls **lshpss**.

```
<hsi version #>/hsi/templates/make_cos.py
cp cos /var/hpss/etc
```

Note: HSI/HTAR versions 6.3 and 8.X use make_cos.pl
When Force Selection is turned on in a COS, an HSI COS configuration file must be updated with noauto in order for that COS to be blocked, except when explicitly called with COSID or the set HSI command.

Example of COS configuration to enable blocking of a COS

```
cat /var/hpss/etc/cos

# HSI Class of Service Definitions
# Auto-generated on host elayne.clearlake.ibm.com on Mon Feb  1 09:58:25 CST 2021

1:     type            = cos
            id              = 1
            noauto
            cosname          = "1wd"
            comment          = "1wd"
            hierarchy        = "1: 1wd"
            access_size      = 4194304
            min_size         = 0
            max_size         = 33554432000
            transfer_rate    = 4096
            latency          = "0"
```

Chapter 5. Client Build Configuration

To install the client tarball, hsihtarclnt.<hsi version #>.tar.gz (previously X.X.tar.gz) is the only package needed. Build configuration is primarily done through a Perl script called **Configure**. To run the **Configure** script, change the directory into the HSI/HTAR source tree, and do the following:

```
cd <hsi version #>

./Configure
```

This script will present the user with questions to answer regarding their build system's configuration. The questions are grouped into various sections, with section headers that explain the nature of the questions that follow. To cancel out of the **Configure** script, use <ctrl-c>.

An example of running this script is given in Appendix A. Proceeding instructions highlight areas that require special attention or to show differences between a server build versus a client build.

After the welcome screen, a list of configuration choices is presented. Pick 1 for client.

```
Would you like to configure the HSI client packages, the server package,
or both?

Enter 1 : to configure just the client
      2 : to configure just the server
      3 : to configure both client and server

Enter selection: 1
```

The next panel of questions deal with configuring encryption/decryption cipher methods. If building the client alone, then the ciphers used by the HSIGWD to connect to the client should be choosen. If this is not known, then select the default which is all of the ciphers. Even though your site may not use any of the four choices given, you must choose at least one of the four ciphers GARBLE, AES, Blowfish, or 3DES to enable authentication. Another option is to take the default setting and keep all the cipher options enabled.

```
 Default Cipher Method Settings

GARBLE cipher................. enabled
AES cipher.................... enabled
Blowfish cipher............... enabled
3DES cipher................... enabled

Use above settings?  (yes/no) [yes]: Choose default yes or at least one of the
four GARBLE, AES, Blowfish, or 3DES
```

The next panel of questions deal with authentication methods. Note that if a site plans to use the SU/SUDO feature, the COMBO authentication method must be enabled during the Configuring Authentication Method Items step.

```
NOTE:
    If you are planning on using RSA Securid fobs, you must enable
    the COMBO authmethod, below.
```

```
Note: Enter "no" below if you would like an explanation of
    each method, as well as an option to enable/disable it.

You can just enter "yes" at this point to use the default settings.
 Default Authmethod Settings

COMBO authmethod.......... disabled
GLOBUS GSI authmethod..... disabled
IDENT authmethod.......... disabled
KERBEROS authmethod....... disabled
KEYTAB authmethod......... disabled
MUNGE authmethod.......... disabled
PAM authmethod............ disabled

Use above settings?  (yes/no) [yes]: Type "no" to change the settings.
This will cycle through each authmethod and ask if you wish to enable.
```

Choose the settings that make sense for your site. In this example, Kerberos authentication method with kerberos-style keytabs is enabled.

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "KERBEROS" authmethod allows users to automatically authenticate without
requiring a password, after they use the Kerberos "kinit" command to create a
ticket-granting ticket. This method requires the Kerberos package to be
installed.  Both MIT and Heimdal Kerberos as recognized, although Heimdal
Kerberos has not yet been tested.

This method must be enabled in order to enable the "keytab" authentication
method for use with kerberos-style keytabs.  It is _not_ required if you are
planning to enable the "keytab" authentication method just for unix-style
keytabs.

Enable "KERBEROS" authmethod? (yes/no) [yes]: Choose "yes" to enable kerberos

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "KEYTAB" authmethod allows users to authenticate automatically without
requiring a password, after they either use the kerberos <ktutil> or the
<hpss_unix_keytab> program (if using unix authentication) to extract a
"keytab" file containing their encrypted password.
This method requires the Kerberos authmethod to be enabled if using
kerberos-style keytabs.

Enable "KEYTAB" authmethod? (yes/no) [yes]: Type "yes" to enable
```

Summary of example settings of Authentication Methods:

```
# ------------- Authentication Methods ---------------
HSI_COMBO_AUTH_SUPPORT = on
HSI_GSI_AUTH_SUPPORT = off
HSI_IDENT_AUTH_SUPPORT = off
HSI_KERBEROS_AUTH_SUPPORT = on
HSI_KEYTAB_AUTH_SUPPORT = on
HSI_MUNGE_AUTH_SUPPORT = off
HSI_PAM_AUTH_SUPPORT = on
```

During the Configuring API Library-Specific Items stage, make sure the NDAPI_SERVER_HOST field is populated with the server host full name. It will be blank for first time through or if the hsi_pkg_includes is deleted under the config directory.

```
++++++++++++++++++++++++++++++++++++++++++++++
     Configuring API Library-Specific Items
++++++++++++++++++++++++++++++++++++++++++++++

In the next screen you will be given the option of changing items that
are specific to the HSI Gateway Client API Library.

Once you have made all the changes that you wish to make (if any),
enter "a" at the prompt to continue.

Press <enter> to continue to the next screen:
If you wish to change an item, enter "c" followed by an optional
space and the item number, or just the item number.
For example:
    "2" or "c 2" or "c2"

If you would like to get help on an item, enter "h" followed by
an optional space and the number, for example:
    "h 3"     or "h3"

 1 MAX_RESTRICTED_PORT .........65535
 2 MIN_RESTRICTED_PORT .........0
 3 NDAPI_DEFAULT_ADDR_FAMILY ...ipv4_only
 4 NDAPI_DEFAULT_AUTH_TYPE .....PAM,COMBO,KEYTAB,KRB_PREEXIST,KERBEROS
 5 NDAPI_LOCAL_LOGFILE .........dev/null
 6 NDAPI_SERVER_HOST ...........
 7 NDAPI_SERVER_PORT ...........1217


[a=accept]  [c N] or [N]->change item N  [h N]->help for item N]
Your choice: Type c 6 to add the server full name.
```

Type in the the server host full name when presented with the following prompt:

NDAPI_SERVER_HOST Current setting: [] Enter new setting: elayne.clearlake.ibm.com

Then press "a" to accept.

Once all the configuration prompts have been completed, **Configure** prompts to allow you to go back and make changes by letting you edit the configuration file directly. If you are satisfied with the choices and answers provided, then press *Enter* to accept the default selection of "no".

```
Writing Makefile include file (config/hsi_pkg_includes)

Creating symlink (config/mach_compile_flags) for linux

... Removing existing symlink

Would you like to edit the configuration file? (yes/no) [no]:

Would you like to compile now? (yes/no) [yes]:
```

This indicates that the configuration is done, and the build is beginning.

The build configuration is stored in the following files, after the initial run of **Configure**:

```
<hsi version #>/config/hsi_pkg_includes
<hsi version #>/config/globus_makefile_defs
```

These files constitute the build configuration. They are read on subsequent runs of **Configure**, so that previous answers are retained. Once created, these files can be updated manually and used to automate the configuration and build process, if needed.

It is not necessary to run **Configure**, and reconfigure the build if a subsequent rebuild is desired. Simply run Compile:

```
usage: Compile [-h] [-a ARCH] [-b BDIR] [-client] [-docs] [-server]
               [-ssl SSLDIR]

Compile -- wrapper to build HSI/HTAR software

optional arguments:
  -h, --help   show this help message and exit
  -a ARCH      Build Platform Architecture
  -b BDIR      User Build Directory
  -client      Build Client
  -docs        Build Formatted Documentation
  -server      Build Server (hsigwd)
  -ssl SSLDIR  OpenSSL Installation Directory
```

Note: The user build directory must be empty or does not exist in order for the compile to execute.

After a build using the default build directory, the hsi and htar executables are located at:

```
<hsi source directory>/bld-<hostname>-<architecture>-<OSversion>/bin/hsi

<hsi source directory>/bld-<hostname>-<architecture>-<OSversion>/bin/htar
```

Example run of Compile with the -b and -client options:

```
$ ./Compile -b /tmp/hsi_client -client
```

After a build using the -b and client options, the hsi and htar executables are located at:

```
/tmp/hsi_client/bin/hsi

/tmp/hsi_client/bin/htar
```

Chapter 6. Client Installation

To install the client, move these executables to an appropriate destination directory such as `/usr/local/bin` or `/opt/bin` or `/usr/local/apps/hsi`.

Typically, wrapper scripts are used to run the HSI-HTAR clients. This allows for the setting and management of the HSI-HTAR runtime environment. An example of a wrapper script can be found in: `<hsi version #>/hsi/templates/hsi.wrapper.template`

- Copy the `HPSS.conf` template to `/var/hpss/etc` and modify it as needed. Make a copy before appending.

```
cp /var/hpss/etc/HPSS.conf /var/hpss/etc/HPSS.conf.ori
cat <hsi version #>/misc/templates/HPSS.conf.template >> /var/hpss/etc/HPSS.conf
```

For sites using Kerberos authentication, make sure that the Server Auth krb5 is turned on. If a krb5 password is being used, make sure that is also turned on. Likewise, for sites using unix authentication, make sure that the Server Authentication Mechanism unix is turned on. For keytab authentication, select, uncomment, and if necessary edit the pathname. In HPSS.conf, see the following example and remove the ";" to uncomment the configuration lines.

```
850   # Authentication mechanism that server uses to get HPSS creds
851   # Valid settings are "unix" and "krb5"
852   ;Server Authentication Mechanism = unix
853    Server Authentication Mechanism = krb5
854
855   # Authenticator type that server uses to prove its identity
856   # Legal values are auth_none, auth_keytab, auth_keyfile, auth_key, auth_passwd
857   # Currently, the only supported value is "auth_keytab"
858   Server Authenticator Type = auth_keytab
859
860   # Authenticator that server uses to prove its identity.
861   # The value of this flag depends upon the Server Authenticator Type.
862   # For auth_keytab, it is the pathname of the keytab file for the server
863      ;Server Authenticator = /var/hpss/etc/hpss.unix.keytab
864      Server Authenticator = /var/hpss/etc/hpss.keytab
```

Appendix A. Example run of Configure

The following is a sample run of **Configure** for configuring and building HSI/HTAR Client software.

```
Starting...
Searching for ar...../usr/bin/ar
Searching for chmod...../bin/chmod
Searching for cp...../bin/cp
Searching for echo...../bin/echo
Searching for ln...../bin/ln
Searching for make...../usr/bin/make
Searching for mkdir...../bin/mkdir
Searching for ranlib...../usr/bin/ranlib
Searching for rm...../bin/rm

Welcome to the HSI Package Installation script.

To cancel this script at any time, enter <ctrl-c>.

This script will allow you to customize most default options, as well as
allowing you to specify or override pathnames for default settings.
You can enter a shell command prefixed by the "!" character any time you are
prompted to enter something from the terminal. For example, at the prompt:
        Hit <enter> to continue:

You might enter
       !/bin/ksh

After successful execution of this script, a "config" directory will be
created if it doesn't already exist, and the file "config/hsi_pkg_includes"
will be created. To start over, simply remove the file and rerun Configure.
If the file is present when this script is started, the values in it will be
used as defaults for the current execution of this script.

You will be given an opportunity at the end of the script to edit the
configuration file, and also to compile the package. If you choose not to
compile after configuring, you can run the "Compile" script at a later time.

Press <enter> to continue

OS is LINUX machine type is x86_64, compflags=compflags.linux_x86_64
============================================================
Would you like to configure the HSI client packages, the server package,
both or neither?

Enter  1  : to configure just the client
       2  : to configure just the server
       3  : to configure both client and server

Enter selection: 3

 --------------------------------------
Configuring client for linux
 --------------------------------------
searching for compiler "cc"...found [/usr/bin/cc]
Enter compiler to be used [/usr/bin/cc]:
(/usr/bin/cc is gcc in disguise)
++++++++++++++++++++++++++++++++++++++++++++++
```

```
Configuring ENCRYPTION/DECRYPTION CIPHER METHODS
++++++++++++++++++++++++++++++++++++++++++++++

In the next screen, you will specify which encryption/decryption ciphers will be
enabled when the client and server are built.

Note that only methods which are supported in the server will be used, even if
other methods are supported in the client.

If the package is being built for use at a single site, then it's best to just
specify the same set of methods for both the client and server (you may have
to check with your HPSS administrator if you are building HSI on a client machine
and you do not know which cipher(s) to enable).

If you are building the client part of the package and expect to use the same
executable to connect to multiple HPSS systems, then you should enable all of
the cipher methods that will be supported at any of the HPSS sites.

Press <enter> to continue to the next screen:

 ------------------------------------------------------
Note: Enter "no" below if you would like an explanation of
each method, as well as an option to enable/disable it.

You can just enter "yes" to use the default settings.
 ------------------------ Default Cipher Method Settings ----------------------

GARBLE cipher................. enabled
AES cipher.................... enabled
Blowfish cipher............... enabled
3DES cipher................... enabled

Use above settings? (yes/no) [yes]: no
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "GARBLE" cipher is a relatively weak encryption mechanism that uses a time-based
algorithm for encryption/decryption. It is very fast, but is not recommended for
environments where strong security is required.

Enable "GARBLE" cipher? (yes/no) [yes]: no
Package will be built with GARBLE cipher disabled

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "AES" cipher is an implementation of the Rijndael encryption algorithm
as specified in FIPS-197.

Enable "AES" cipher? (yes/no) [yes]:
Package will be built with AES cipher enabled


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "blowfish" cipher is a block cipher designed by Bruce Schneier of "Applied
Cryptography"
fame. This algorithm has a good security margin and is the fastest block cipher
provided
by OpenSSL.

Enable "blowfish" cipher? (yes/no) [yes]: no
Package will be built with blowfish cipher disabled
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "3DES" cipher (also commonly referred to as "triple-DES") is the most widely
popular variant of DES ("Data Encryption Standard"). This is probably the most
conservative symmetric cipher available, due to the wide scrutiny of DES, but is also
the slowest algorithm available.

Enable "3DES" cipher? (yes/no) [yes]: no
Package will be built with 3DES cipher disabled

OpenSSL will be required
++++++++++++++++++++++++++++++++++++++++++++++
Configuring AUTHENTICATION METHOD Items
++++++++++++++++++++++++++++++++++++++++++++++

In the next screen, you will specify which authentication methods will be
enabled when the client and server are built. Note that only methods which
are supported in the server will be used, even if other methods are supported
in the client.

If the package is being built for use at a single site, then it is best to just
specify the same set of methods for both the client and server (you may have to
check with your HPSS administrator if you are building HSI on a client machine
and you do not know which authmethod(s) should be enabled for your site).*

If you are building the client part of the package and expect to use the same
executable to connect to multiple HPSS systems, then you should enable all of
the auth methods that will be supported at any of the HPSS sites.

Press <enter> to continue to the next screen:*

NOTE:
      If you are planning on using RSA Securid fobs, you must enable
      the COMBO authmethod, below.
 ------------------------------------------------
Note: Enter "no" below if you would like an explanation of
      each method, as well as an option to enable/disable it.

You can just enter "yes" at this point to use the default settings.
 ------------------------ Default Authmethod Settings ----------------------

COMBO authmethod........... disabled
GLOBUS GSI authmethod...... disabled
IDENT authmethod........... disabled
KERBEROS authmethod........ enabled
KEYTAB authmethod.......... enabled
LOCAL authmethod........... disabled
MUNGE authmethod........... disabled
PAM authmethod............. enabled

Use above settings? (yes/no) [yes]: no
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "COMBO" authmethod allows users to authenticate by entering a username and
password (these are NOT sent in plaintext across the network). This method
is often enabled for use by administrators.

Notes:
1. As of HPSS 7.4.3, sites should consider PAM support instead of
   enabling this option.  If both are enabled, then PAM authentication
   will be used instead of this option.
```

```
2. Either this option or PAM must be enabled when building the HSIGWD
      server if RSA Securid one-time-password checking is to be used.


Enable "COMBO" authmethod? (yes/no) [no]:
Package will be built with COMBO authmethod disabled


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "IDENT" authmethod allows users to authenticate automatically without
requiring a password if they are running on trusted machines that support the
IDENT protocol. This authmethod is currently implemented for the LLNL variant
of IDENT, and probably is not useful at other sites.

Enable "IDENT" authmethod? (yes/no) [no]: yes
Package will be built with IDENT authmethod enabled


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "GLOBUS GSI" authmethod allows users to authenticate automatically without
requiring a password, after they use the GLOBUS "grid-proxy-init" command to
create a GLOBUS proxy. This method requires the GLOBUS package to be installed,
and the GLOBUS packages for the client and server must be at a compatible level.
(Check with the local GLOBUS administrator if need be). The user's Globus
certificate DN must also be added to the grid-mapfile on the HSIGW server machine.

Enable "GLOBUS GSI" authmethod? (yes/no) [no]:
Package will be built with GLOBUS GSI authmethod disabled


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "KERBEROS" authmethod allows users to automatically authenticate without
requiring a password, after they use the Kerberos "kinit" command to create a
ticket-granting ticket. This method requires the Kerberos package to be installed.
Both MIT and Heimdal Kerberos as recognized, although Heimdal Kerberos has not yet
been tested.

This method must be enabled in order to enable the "keytab" authentication method
for use with kerberos-style keytabs. It is _not_ required if you are planning
to enable the "keytab" authentication method just for unix-style keytabs.

Enable "KERBEROS" authmethod? (yes/no) [yes]:
Package will be built with KERBEROS authmethod enabled


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "KEYTAB" authmethod allows users to authenticate automatically without
requiring a password, after they either use the kerberos <ktutil> or the
<hpss_unix_keytab> program (if using unix authentication) to extract a
"keytab" file containing their encrypted password.
This method requires the Kerberos authmethod to be enabled if using kerberos-style
keytabs.

Enable "KEYTAB" authmethod? (yes/no) [yes]: no
Package will be built with KEYTAB authmethod disabled


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
The "MUNGE" authmethod allows users to authenticate within a security domain
by obtaining a security context from a munge daemon that runs on the same
host as the client, and then sending the encrypted contents to the server,
which uses the munge daemon on its machine to decrypt the context, and
obtain the uid and gid of the user on the client machine.

Enable "MUNGE" authmethod? (yes/no) [no]:
Package will be built with MUNGE authmethod disabled


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
The "PAM" authmethod enables use of Pluggable Authentication Modules on
the HSI Gateway Server for Authentication. This in turn provides a variety
of possible site-defined mechanisms, such as passwords, RSA SecurID fobs,
etc. If available and configured on the HSI Gateway Server, it is
recommended that this method be enabled and COMBO method be disabled.

Enable "PAM" authmethod? (yes/no) [yes]: yes
Package will be built with PAM_EOF authmethod enabled


++++++++++++++++++++++++++++++++++++++++++++++
              Configuring KERBEROS Items
++++++++++++++++++++++++++++++++++++++++++++++

Now you will enter the Kerberos service name that will be used for
obtaining a service ticket when authenticating with the HSI Gateway Process.
This same service name is used on both the client and server. It is usually
"ftp" or "host".
(Some sites also use "hpss_hsigwd" or "hpss_ndapid")

If you are using kerberized pftp, you will probably want to use "ftp"
for this.

If you are uncertain as to what to specify here, you should ask your
kerberos administrator to check the keytab entries in /etc/v5srvtab
on the machine that hosts the HSI Gateway Daemon process.


Kerberos service name: [ftp] host
Looking for kerberos base installation path....
Looks like the kerberos base path on this system is "/usr", and include path is
"/usr/include"
Use "/usr" as the base path? (no to specify your own) (yes/no) [yes]:

Checking which version of the crypto library to use....Using k5crypto

Choosing whether to automatically run kinit if needed to obtain credentials...
Automatically run kinit if needed? (yes/no) [yes]:
kinit will automatically be run if needed to obtain credentials
Found kinit: /usr/bin/kinit
Looking for OpenSSL base installation path....
Looks like the OpenSSL base path on this system is "/usr"
Use "/usr" as the base path? (no to specify your own) (yes/no) [yes]:

++++++++++++++++++++++++++++++++++++++++++++++*
       Configuring API Library-Specific Items
++++++++++++++++++++++++++++++++++++++++++++++*
```

```
In the next screen you will be given the option of changing items that
are specific to the HSI Gateway Client API Library.

Once you have made all the changes that you wish to make (if any),
enter "a" at the prompt to continue.

Press <enter> to continue to the next screen:
If you wish to change an item, enter "c" followed by an optional
space and the item number, or just the item number.
For example:
      "2" or "c 2" or "c2"

If you would like to get help on an item, enter "h" followed by
an optional space and the number, for example:
      "h 3" or "h3"

 --------------------------
 1 MAX_RESTRICTED_PORT .........65535
 2 MIN_RESTRICTED_PORT .........0
 3 NDAPI_DEFAULT_ADDR_FAMILY ...ipv4_only
 4 NDAPI_DEFAULT_AUTH_TYPE .....KRB_PREEXIST,KERBEROS,IDENT
 5 NDAPI_LOCAL_LOGFILE ........./dev/null
 6 NDAPI_SERVER_HOST ...........
 7 NDAPI_SERVER_PORT ...........1217
 --------------------------

[a=accept] [c N] or [N]->change item N [h N]->help for item N]
Your choice: 6
NDAPI_SERVER_HOST Current setting: []
Enter new setting: elayne.clearlake.ibm.com
 --------------------------
 1 MAX_RESTRICTED_PORT .........65535
 2 MIN_RESTRICTED_PORT .........0
 3 NDAPI_DEFAULT_ADDR_FAMILY ...ipv4_only
 4 NDAPI_DEFAULT_AUTH_TYPE .....KRB_PREEXIST,KERBEROS,IDENT
 5 NDAPI_LOCAL_LOGFILE ........./dev/null
 6 NDAPI_SERVER_HOST ...........elayne.clearlake.ibm.com
 7 NDAPI_SERVER_PORT ...........1217
 --------------------------

[a=accept] [c N] or [N]->change item N [h N]->help for item N]
Your choice: 4
NDAPI_DEFAULT_AUTH_TYPE Current setting: [KRB_PREEXIST,KERBEROS,IDENT]
 ---------------------------------
Choose default auth method(s) to be used by the client library:
They will be tried in the order that you specify them.

Hit <enter> by itself to terminate selection
Enter -1 to clear the list and start over

Current setting: []
(Hit <enter> by itself to terminate selection)
0 ............. IDENT
1 ............. KRB_PREEXIST
2 ............. KERBEROS
Choose: 0
Current setting: [IDENT]
(Hit <enter> by itself to terminate selection)
0 ............. IDENT
```

```
1 ............. KRB_PREEXIST
2 ............. KERBEROS
Choose: 1
Current setting: [IDENT,KRB_PREEXIST]
(Hit <enter> by itself to terminate selection)
0 ............. IDENT
1 ............. KRB_PREEXIST
2 ............. KERBEROS
Choose:
 ---------------------------
 1 MAX_RESTRICTED_PORT .........65535
 2 MIN_RESTRICTED_PORT .........0
 3 NDAPI_DEFAULT_ADDR_FAMILY ...ipv4_only
 4 NDAPI_DEFAULT_AUTH_TYPE .....IDENT,KRB_PREEXIST
 5 NDAPI_LOCAL_LOGFILE ........./dev/null
 6 NDAPI_SERVER_HOST ...........hpss.lanl.gov
 7 NDAPI_SERVER_PORT ...........1217
 ---------------------------

[a=accept] [c N] or [N]->change item N [h N]->help for item N]
Your choice: a

++++++++++++++++++++++++++++++++++++++++++++++++
        Configuring HSI-Specific Items
++++++++++++++++++++++++++++++++++++++++++++++++

In the next screen, you will be given the option of changing items that
are specific to the HSI program. Once you have made all the changes that
you wish to make (if any), enter "a" at the prompt to continue.

Press <enter> to continue to the next screen:

If you wish to change an item below, enter "c" followed by an optional
space and the item number, or just the item number.
For example:
      "5" or "c 5" or "c5"

If you would like to get help on an item, enter "h" followed by
an optional space and the number, for example:
      "h 3" or "h3"
 ---------------------------
 1 HSI_CKSUM_HASHTYPE ...........MD5
 2 HSI_CKSUM_ONOFF ..............off
 3 HSI_DEFAULT_IO_BUFSIZE .......8388608
 4 HSI_HPSS_CONFIG_DIR ........../var/hpss/etc
 5 HSI_INTER_HPSS_PORT ..........1217
 6 HSI_LIBEDIT_SUPPORT ..........off
 7 HSI_LOCAL_CONFIG_DIR ........./usr/local/etc
 8 HSI_MAX_IO_BUFSIZE ...........33554432
 9 HSI_MIN_IO_BUFSIZE ...........1048576
 10 HSI_SITENAME .................HOUSTON
 11 HSI_TRANSFER_AGENT_SUPPORT ...off
 ---------------------------

[a=accept] [c N] or [N]->edit item N [h N]->help for item N]
Your choice: a

++++++++++++++++++++++++++++++++++++++++++++++++
        Configuring HTAR-Specific Items
```

```
+++++++++++++++++++++++++++++++++++++++++++++

In the next screen, you will be given the option of changing items that
are specific to the HTAR program. Once you have made all the changes that
you wish to make (if any), enter "a" at the prompt to continue.

Press <enter> to continue:
If you wish to change an item, enter "c" followed by an optional
space and the item number, or just the item number.
For example:
      "5" or "c 5" or "c5"

If you would like to get help on an item, enter "h" followed by
an optional space and the number, for example:
      "h 3" or "h3"
 --------------------------
 1 HTAR_ABS_MAX_MEMBER_FILES ...5000000
 2 HTAR_ARCHIVE_COPY_COUNT .....1
 3 HTAR_ARCHIVE_COS ............NONE
 4 HTAR_DEFAULT_IOBUF ..........8388608
 5 HTAR_DEF_MAX_MEMBER_FILES ...1000000
 6 HTAR_ENABLE_PREALLOCATION ...off
 7 HTAR_LOCAL_FILE_THREADS .....50
 8 HTAR_NDAPI_REQUIRED_OPT .....yes
 --------------------------

[a=accept] [c N] or [N]->edit item N [h N]->help for item N]
Your choice: a
Writing Makefile include file (config/hsi_pkg_includes)
Creating symlink (config/mach_compile_flags) for linux
... Removing existing symlink
Would you like to edit the configuration file? (yes/no) [no]:
Would you like to compile now? (yes/no) [yes]:

Generating Build: cmake -S. -Bbld-elayne-linux_ppc64le-redhat7.9 -DSERVER=1 -DCLIENT=1
-- The C compiler identification is GNU 4.8.5
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
-- Check for working C compiler: /usr/bin/cc - skipped
-- Detecting C compile features
-- Detecting C compile features - done
-- Found OpenSSL: /usr/lib64/libcrypto.so (found version "1.0.2k")
-- Use _DEFAULT_SOURCE? no
-- MACH_C_FLAGS:  -DLINUX -Dlinux_ppc64 -DHAS_STDINT_XDR -DSAN3P_ENABLED -pthread -DPTHRE
-- CONFIG_C_FLAGS:  -DENABLE_OPENSSL_SUPPORT -UENABLE_GARBLE_ENCRYPTION -DENABLE_AES_ENCR
-- CONFIG_LD_FLAGS: -lpam -ltirpc
Configuring HSI/HTAR CLIENT build
Configuring HSI/HTAR SERVER build
-- Configuring done
-- Generating done
-- Build files have been written to: /hsihtar_src/9.2/bld-elayne-linux_ppc64le-redhat7.9
Running Build: cmake --build bld-elayne-linux_ppc64le-redhat7.9 --clean-first
Scanning dependencies of target hpss_extensions_srvr
[  0%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_auth_fu
[  0%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_cos_func
[  0%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_cos.c.o
[  1%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_cosparse
[  1%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_crypt_fu
[  1%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_motd.c.o
```

```
[  1%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_openssl
[  2%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_record_
[  2%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpsscfgx_res
[  2%] Building C object CMakeFiles/hpss_extensions_srvr.dir/api_extensions/hpss_site_in
[  3%] Linking C static library lib/libhpss_extensions_srvr.a
[  3%] Built target hpss_extensions_srvr
Scanning dependencies of target hpssapi
[  4%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hpss_hash.c.o
[  4%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hpss_interop.c.o
[  4%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hpss_MemAlign.c.o
[  4%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hpss_net.c.o
[  5%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hpssoid.c.o
[  5%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hpss_UUID.c.o
[  5%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/mvrprotocol.c.o
[  6%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/mvrsckt.c.o
[  6%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/pdata.c.o
[  6%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/san3p.c.o
[  6%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/san3p_util.c.o
[  7%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_init.c.o
[  7%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_apiconfig.c.o
[  7%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_authenticate.c.o
[  8%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_access.c.o
[  8%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_acct.c.o
[  8%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_acl.c.o
[  8%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_bfsattrs.c.o
[  9%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_chdir.c.o
[  9%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_chown.c.o
[  9%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_chmod.c.o
[  9%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_chroot.c.o
[ 10%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_cli.c.o
[ 10%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_closedir.c.o
[ 10%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_convertids.c.o
[ 11%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_copyfile.c.o
[ 11%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_fclear.c.o
[ 11%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_fdigest.c.o
[ 11%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_fgetattr.c.o
[ 12%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_file_extensions.c.o
[ 12%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_filesets.c.o
[ 12%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_fsetattr.c.o
[ 13%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_getcwd.c.o
[ 13%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_group.c.o
[ 13%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_io_misc.c.o
[ 13%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_junctions.c.o
[ 14%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_chmod.c.o
[ 14%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_chown.c.o
[ 14%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_getcwd.c.o
[ 15%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_io.c.o
[ 15%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_mkdir.c.o
[ 15%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_rdlink.c.o
[ 15%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_readdir.c.o
[ 16%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_rename.c.o
[ 16%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_stat.c.o
[ 16%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lfx_unlink.c.o
[ 17%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_link.c.o
[ 17%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_logging.c.o
[ 17%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lookup.c.o
[ 17%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_lseek.c.o
[ 18%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_map_errno.c.o
[ 18%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_mkdir.c.o
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[ 18%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_motd.c.o
[ 18%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_msgprocs.c.o
[ 19%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_multi_hpss.c.o
[ 19%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_open.c.o
[ 19%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_opendir.c.o
[ 20%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_openlog.c.o
[ 20%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_purge.c.o
[ 20%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_rddir.c.o
[ 20%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_rdlink.c.o
[ 21%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_read.c.o
[ 21%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_reconnect.c.o
[ 21%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_rename.c.o
[ 22%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_requestId.c.o
[ 22%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_rewdir.c.o
[ 22%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_rmdir.c.o
[ 22%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_selectcos.c.o
[ 23%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_setcos.c.o
[ 23%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_sethost.c.o
[ 23%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_siteinfo.c.o
[ 24%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_sockets.c.o
[ 24%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_stage.c.o
[ 24%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_stat.c.o
[ 24%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_statfs.c.o
[ 25%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_su.c.o
[ 25%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_subsysstats.c.o
[ 25%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_symlink.c.o
[ 26%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_threads.c.o
[ 26%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_trunc.c.o
[ 26%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_uda_expire.c.o
[ 26%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_umask.c.o
[ 27%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_unlink.c.o
[ 27%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_utime.c.o
[ 27%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_write.c.o
[ 27%] Building C object CMakeFiles/hpssapi.dir/ndapi/ndclient/hsigw_xfer_concur.c.o
[ 28%] Building C object CMakeFiles/hpssapi.dir/ndapi/common/u_signed64.c.o
[ 28%] Building C object CMakeFiles/hpssapi.dir/ndapi/common/hsigw_xdr.c.o
[ 28%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_auth_funcs.c.o
[ 29%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_cos_functions.c.o
[ 29%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_cos.c.o
[ 29%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_cosparse.c.o
[ 29%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpsscfgx_config_api.c.o
[ 30%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpsscfgx_cfg_functions.c.
[ 30%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpsscfgx_GetClientInterfa
[ 30%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpsscfgx_hpssconf.c.o
[ 31%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpsscfgx_restricted_ports
[ 31%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_conv.c.o
[ 31%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_crypt_funcs.c.o
[ 31%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_expire.c.o
[ 32%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_motd.c.o
[ 32%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_netrc.c.o
[ 32%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_openssl.c.o
[ 33%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpsscfgx_pattern_match.c.
[ 33%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_record_io.c.o
[ 33%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpsscfgx_restricted_addr.
[ 33%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_site_info.c.o
[ 34%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_scheduler.c.o
[ 34%] Building C object CMakeFiles/hpssapi.dir/api_extensions/hpss_u64conv.c.o
[ 34%] Linking C static library lib/libhpssapi.a
[ 34%] Built target hpssapi
```

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[ 34%] Generating ../../../hsi/src/hsi_version.c
Scanning dependencies of target hsi
[ 35%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi.c.o
[ 35%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_AclCommand.c.o
[ 35%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Account.c.o
[ 36%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Annotate.c.o
[ 36%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_COS.c.o
[ 36%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Debug.c.o
[ 36%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Chdir.c.o
[ 37%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_ChecksumCmd.c.o
[ 37%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Chmod.c.o
[ 37%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Chown.c.o
[ 38%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_ClientInterface.c.o
[ 38%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_CmdEditor.c.o
[ 38%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Command.c.o
[ 38%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Crename.c.o
[ 39%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_ControlCmds.c.o
[ 39%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_CopyCommand.c.o
[ 39%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_DirProcs.c.o
/hsihtar_src/9.2/hsi/src/hsi_DirProcs.c: In function ‘readHPSSdir’:
/hsihtar_src/9.2/hsi/src/hsi_DirProcs.c:279:3: warning: ‘hpss_ReadAttrs’ is deprecated (
   RETRY(entryCount = hpss_ReadAttrs(Dir,
   ^
[ 40%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_DuCommand.c.o
[ 40%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_DumpCommand.c.o
[ 40%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_FileCopy.c.o
[ 40%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_FileDigest.c.o
[ 41%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_FileMisc.c.o
[ 41%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_FileRead.c.o
[ 41%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_FilesetCommand.c.o
[ 42%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_FileWrite.c.o
[ 42%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Find.c.o
/hsihtar_src/9.2/hsi/src/hsi_Find.c: In function ‘searchDir’:
/hsihtar_src/9.2/hsi/src/hsi_Find.c:590:3: warning: ‘hpss_ReadAttrs’ is deprecated (decla
   RETRY(entryCount = hpss_ReadAttrs(Dir
   ^
[ 42%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Firewall.c.o
[ 42%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Getopt.c.o
[ 43%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Glob.c.o
/hsihtar_src/9.2/hsi/src/hsi_Glob.c: In function ‘matchHPSSdir’:
/hsihtar_src/9.2/hsi/src/hsi_Glob.c:1295:10: warning: ‘hpss_ReadAttrs’ is deprecated (de
          RETRY(entryCount = hpss_ReadAttrs(Dir,
          ^
[ 43%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_GlobalLocks.c.o
[ 43%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_GPFS_interface.c.o
[ 43%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_GroupCommand.c.o
[ 44%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_HashCommand.c.o
[ 44%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Help.c.o
[ 44%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_HpssPioMgr.c.o
[ 45%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_History.c.o
[ 45%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_HsigwdCommand.c.o
[ 45%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_IdCommand.c.o
[ 45%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_IHCopyLocalMethod.c.o
[ 46%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_IHCopyNdapidMethod.c.o
[ 46%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_JunctionCommand.c.o
[ 46%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Keyset.c.o
[ 47%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_LFM.c.o
[ 47%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_LfmPathCheck.c.o
[ 47%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Link.c.o
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[ 47%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Ls.c.o
[ 48%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Local.c.o
[ 48%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_LocalXfers.c.o
[ 48%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_LocalXferMisc.c.o
[ 49%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Logging.c.o
[ 49%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_LogicalDrives.c.o
[ 49%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_MigratePurge.c.o
[ 49%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Misc.c.o
[ 50%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Mkdir.c.o
[ 50%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_MultiHPSS.c.o
[ 50%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_MvCommand.c.o
[ 51%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_NetIO.c.o
[ 51%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Parser.c.o
[ 51%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_PartialXfers.c.o
[ 51%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_PathProcs.c.o
[ 52%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Perror.c.o
[ 52%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Prompt.c.o
[ 52%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Purgelock.c.o
[ 52%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Rc.c.o
[ 53%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_ReadCommand.c.o
[ 53%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_ReadParallel.c.o
[ 53%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_ReadViaAPI.c.o
[ 54%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Rename.c.o
[ 54%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_RmCommand.c.o
[ 54%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_RmdirCommand.c.o
[ 54%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_RmtSite.c.o
[ 55%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Scheduler.c.o
[ 55%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Signals.c.o
[ 55%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Sockets.c.o
[ 56%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Stage.c.o
[ 56%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Su.c.o
[ 56%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_TA_HPSS.c.o
[ 56%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_TA_Local.c.o
[ 57%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_TA_Misc.c.o
[ 57%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_ThreadMisc.c.o
[ 57%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_TrashCan.c.o
[ 58%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_TouchCommand.c.o
[ 58%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Tty.c.o
[ 58%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_UdaInterface.c.o
[ 58%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_Umask.c.o
[ 59%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_version.c.o
[ 59%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_WriteCommand.c.o
[ 59%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_WriteParallel.c.o
[ 59%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_WriteViaAPI.c.o
[ 60%] Building C object hsi/src/CMakeFiles/hsi.dir/hsi_XferProgressThread.c.o
[ 60%] Linking C executable ../../bin/hsi
[ 60%] Built target hsi
[ 60%] Generating ../../../htar/src/htar_version.c
Scanning dependencies of target htar
[ 61%] Building C object htar/src/CMakeFiles/htar.dir/htar.c.o
[ 61%] Building C object htar/src/CMakeFiles/htar.dir/htar_Annotate.c.o
[ 61%] Building C object htar/src/CMakeFiles/htar.dir/htar_Append.c.o
[ 61%] Building C object htar/src/CMakeFiles/htar.dir/htar_ArchiveFile.c.o
[ 62%] Building C object htar/src/CMakeFiles/htar.dir/htar_BuildIndex.c.o
[ 62%] Building C object htar/src/CMakeFiles/htar.dir/htar_Compare.c.o
[ 62%] Building C object htar/src/CMakeFiles/htar.dir/htar_CompareCksums.c.o
[ 63%] Building C object htar/src/CMakeFiles/htar.dir/htar_Consistency.c.o
[ 63%] Building C object htar/src/CMakeFiles/htar.dir/htar_Copy.c.o
[ 63%] Building C object htar/src/CMakeFiles/htar.dir/htar_CopyFromHPSSArchive.c.o
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[ 63%] Building C object htar/src/CMakeFiles/htar.dir/htar_CopyToHPSSArchive.c.o
[ 64%] Building C object htar/src/CMakeFiles/htar.dir/htar_Create.c.o
[ 64%] Building C object htar/src/CMakeFiles/htar.dir/htar_Debug.c.o
[ 64%] Building C object htar/src/CMakeFiles/htar.dir/htar_DirProcs.c.o
/hsihtar_src/9.2/htar/src/htar_DirProcs.c: In function ‘htar_ReadHpssDir’:
/hsihtar_src/9.2/htar/src/htar_DirProcs.c:273:9: warning: ‘hpss_ReadAttrs’ is deprecated
         entryCount = hpss_ReadAttrs(Dir,
         ^
[ 65%] Building C object htar/src/CMakeFiles/htar.dir/htar_Delete.c.o
[ 65%] Building C object htar/src/CMakeFiles/htar.dir/htar_DumpState.c.o
[ 65%] Building C object htar/src/CMakeFiles/htar.dir/htar_Exclude.c.o
[ 65%] Building C object htar/src/CMakeFiles/htar.dir/htar_Expire.c.o
[ 66%] Building C object htar/src/CMakeFiles/htar.dir/htar_Extract.c.o
[ 66%] Building C object htar/src/CMakeFiles/htar.dir/htar_FileMisc.c.o
[ 66%] Building C object htar/src/CMakeFiles/htar.dir/htar_GenLists.c.o
[ 67%] Building C object htar/src/CMakeFiles/htar.dir/htar_Glob.c.o
/hsihtar_src/9.2/htar/src/htar_Glob.c: In function ‘matchHPSSdir’:
/hsihtar_src/9.2/htar/src/htar_Glob.c:859:13: warning: ‘hpss_ReadAttrs’ is deprecated (d
             entryCount = hpss_ReadAttrs(Dir,
             ^
[ 67%] Building C object htar/src/CMakeFiles/htar.dir/htar_GpfsInterfaces.c.o
[ 67%] Building C object htar/src/CMakeFiles/htar.dir/htar_GlobalLocks.c.o
[ 67%] Building C object htar/src/CMakeFiles/htar.dir/htar_IndexFile.c.o
[ 68%] Building C object htar/src/CMakeFiles/htar.dir/htar_LfxXfer.c.o
[ 68%] Building C object htar/src/CMakeFiles/htar.dir/htar_LfxXferMisc.c.o
[ 68%] Building C object htar/src/CMakeFiles/htar.dir/htar_List.c.o
[ 68%] Building C object htar/src/CMakeFiles/htar.dir/htar_LocalArchive.c.o
[ 69%] Building C object htar/src/CMakeFiles/htar.dir/htar_LocalFileReadThread.c.o
[ 69%] Building C object htar/src/CMakeFiles/htar.dir/htar_Logging.c.o
[ 69%] Building C object htar/src/CMakeFiles/htar.dir/htar_Memmgr.c.o
[ 70%] Building C object htar/src/CMakeFiles/htar.dir/htar_MemberFiles.c.o
[ 70%] Building C object htar/src/CMakeFiles/htar.dir/htar_Misc.c.o
[ 70%] Building C object htar/src/CMakeFiles/htar.dir/htar_ParseCmdLine.c.o
[ 70%] Building C object htar/src/CMakeFiles/htar.dir/htar_ParseExcludes.c.o
[ 71%] Building C object htar/src/CMakeFiles/htar.dir/htar_PathProcs.c.o
[ 71%] Building C object htar/src/CMakeFiles/htar.dir/htar_Rc.c.o
[ 71%] Building C object htar/src/CMakeFiles/htar.dir/htar_ReadArchive.c.o
[ 72%] Building C object htar/src/CMakeFiles/htar.dir/htar_ReadIodError.c.o
[ 72%] Building C object htar/src/CMakeFiles/htar.dir/htar_RemoteArchive.c.o
[ 72%] Building C object htar/src/CMakeFiles/htar.dir/htar_Repack.c.o
[ 72%] Building C object htar/src/CMakeFiles/htar.dir/htar_Shutdown.c.o
[ 73%] Building C object htar/src/CMakeFiles/htar.dir/htar_Signal.c.o
[ 73%] Building C object htar/src/CMakeFiles/htar.dir/htar_StatusFuncs.c.o
[ 73%] Building C object htar/src/CMakeFiles/htar.dir/htar_Update.c.o
[ 74%] Building C object htar/src/CMakeFiles/htar.dir/htar_UidGidToName.c.o
[ 74%] Building C object htar/src/CMakeFiles/htar.dir/htar_Verify.c.o
[ 74%] Building C object htar/src/CMakeFiles/htar.dir/htar_VerifySupport.c.o
[ 74%] Building C object htar/src/CMakeFiles/htar.dir/htar_version.c.o
[ 75%] Building C object htar/src/CMakeFiles/htar.dir/htar_WriteIodError.c.o
[ 75%] Building C object htar/src/CMakeFiles/htar.dir/htar_WriteLocalArchive.c.o
[ 75%] Building C object htar/src/CMakeFiles/htar.dir/htar_WriteXferThread.c.o
[ 76%] Linking C executable ../../bin/htar
CMakeFiles/htar.dir/htar_IndexFile.c.o: In function `htar_CopyAndAdjustLocalIndex':
/hsihtar_src/9.2/htar/src/htar_IndexFile.c:468: warning: the use of `mktemp' is dangerou
[ 76%] Built target htar
Scanning dependencies of target hpss_hsigwd.9.2.0
[ 76%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd.c.o
[ 76%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_acct.c.o
[ 76%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_admin.c.
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[ 77%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_auth.c.o
[ 77%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_GASAPI_w
[ 77%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_check_au
[ 78%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_cli.c.o
[ 78%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_cli_Comma
[ 78%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_combo_au
[ 78%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_ctl.c.o
[ 79%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_deny.c.o
[ 79%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_extensio
[ 79%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_fdigest.
[ 80%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_filesets
[ 80%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_gsi_auth
[ 80%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_hpss_api
/hsihtar_src/9.2/ndapi/ndserver/hsigwd_hpss_api.c: In function ‘ndapi_statfs’:
/hsihtar_src/9.2/ndapi/ndserver/hsigwd_hpss_api.c:3632:5: warning: ‘hpss_Statfs’ is depr
     result = hpss_Statfs(param->CosId, &buf);
     ^
[ 80%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_hgs.c.o
[ 81%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_hgs_ipc.
[ 81%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_ident_cl
[ 81%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_ids.c.o
[ 81%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_io.c.o
[ 82%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_lfx_api.
[ 82%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_lfx_Loca
[ 82%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_lfx_Loca
[ 83%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_lfx_Xfer
[ 83%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_lookup.c
[ 83%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_logging.
[ 83%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_mapfile.
[ 84%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_misc.c.o
[ 84%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_msgprocs
[ 84%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_openssl.
[ 85%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_plugins.
[ 85%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_quotas.c
[ 85%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_rcv_msgd
[ 85%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_rgy_func
[ 86%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_sockets.
[ 86%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_sscopy.c
[ 86%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_sysinfo.
[ 87%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_schedule
[ 87%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_sched_ap
[ 87%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_signal.c
[ 87%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_ssmisc.c
[ 88%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_su.c.o
[ 88%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_su_auth.
[ 88%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_su_init.
[ 89%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_su_misc.
[ 89%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_ThreadMi
[ 89%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_uda_expi
[ 89%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsigwd_uda_misc
[ 90%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_AclMisc
[ 90%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Annotat
[ 90%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_ChaclCo
[ 90%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_ChdirCo
[ 91%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_ChmodCo
[ 91%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_ChownCo
[ 91%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Control
[ 92%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_COS.c.o
[ 92%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_DirProc
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[ 92%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_DuComma
[ 92%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_DumpCom
[ 93%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Expire.
[ 93%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_FileMis
[ 93%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Getopt.
[ 94%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_GiveCom
[ 94%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Glob.c.
[ 94%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_HashCom
[ 94%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Keyset.
[ 95%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Logging
[ 95%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_LnComma
[ 95%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_LsaclCo
[ 96%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_LsComma
[ 96%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Memmgr.
[ 96%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Misc.c.
[ 96%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_MkdirCo
[ 97%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_MvComma
[ 97%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Parser.
[ 97%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_PathPro
[ 98%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_Perror.
[ 98%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_PrintFu
[ 98%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_PurgeLo
[ 98%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_RenameC
[ 99%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_RmComma
[ 99%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_RmdirCo
[ 99%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_SystemC
[ 99%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_TouchCo
[100%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/hsi_cli_TrashCo
[100%] Building C object ndapi/ndserver/CMakeFiles/hpss_hsigwd.9.2.0.dir/__/common/hsigw
[100%] Linking C executable ../../bin/hpss_hsigwd.9.2.0
[100%] Built target hpss_hsigwd.9.2.0
Build complete. All executables are located in ./bld-elayne-linux_ppc64le-redhat7.9/bin
root@elayne /hsihtar_src/9.2
```