KART: A Simple Client/server Interface to Access Different Tape Devices at CINECA Site

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Introduction

- In 1989 STK 4400 installation

- Access through IBM/VM station only (fetch, dispose)

- In 1991 direct BMX channel connection between the C90 and the STK 4400

- Some software needed to provide controlled and easy access to the silo...

The KART package

- Goals:

  – controlled access to the silo

  – few simple commands

  – logical volume concept

  – transparent read/write

- Development platform: Unicos

The basic components

- Tape Data Base (TDB):
  - keeps track of physical volume ownership
  - keeps track of access permissions
  - keeps track of volume residency

- KART:
  - keeps track of volume contents
  - logical volume creation and management commands
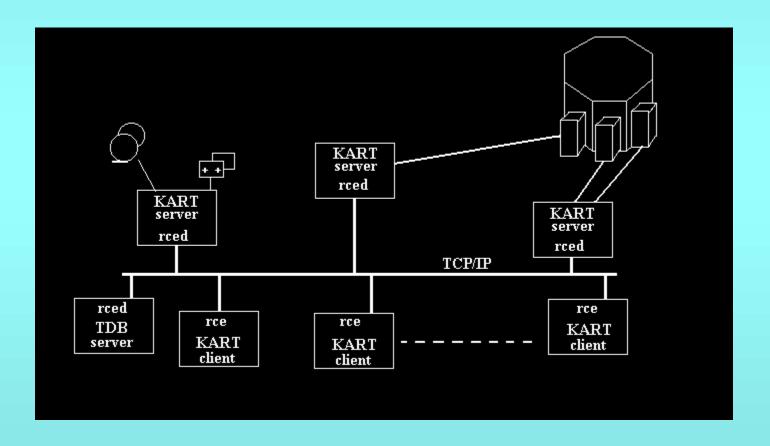
The client/server implementation

● Main reasons:

   – a more general and portable interface

   – a request might come from any point on the LAN

   – users should not need to be defined on the server system to get
     access to some tape device

   – flexibility to accomodate future requirements

The client/server implementation (2)

- Socket based (TCP/IP)
- Server side daemon *rced (remote command execution daemon)*
- Client side interface *rce*
- The data stream goes through the communication network

KART: the client/server model

The KART/TDB internal information

- Two sets of data:
  - a physical volume tape data base
  - a centralized KART data repository
- TDB and KART server may run on different systems
- KART data repository is presently constrained to be resident on a device server to handle the volume locking correctly

The TDB internal data repository

- Basic data:
  - physical volume owner (username)
  - media type and characteristics
  - media residency (SILO, CART, VAULT)
  - uncompressed capacity
  - compression enabling flag
  - VSN
  - access permissions and ACL
  - time stamps

The KART data base of volumes

- It is resident on the KART server attached to a tape device
- There might be many of them
- No distributed volume locking mechanism: still under construction
- It is implemented as Unix directory

The KART data base of volumes (2)

- Basic logical volume information:
  - VSN list of physical volumes
  - media block size
  - list of files copied on volume
  - file size in bytes, blocks and timestamp
  - compression enabling flag
  - permissions

The KART set of commands

- to create a new logical volume:
  - kart_new volume_name VSN1 VSN2 VSN3

- to list volume contents:
  - kart_dir volume_name

- to copy to volume:
  - kart_put volume_name file_name_on_volume < file_to_copy

The KART set of commands (2)

- to read a file from volume:
  - kart_get volume_name file_on_volume > file_to_read

- to set access control list and permissions:
  - kart_acl -u target_user -a -p rw

KART volume content listing

```
-----------------------
CARTUCCIA:      sirio1_tot1
Volumi fisici:               1
Tipo volumi  : SD3C/50000Mb
Compressione : y
Label[s]:       XC0064
Totale files:  7
------------------------------------------------------------------
FILE                      BYTES     DATA      ORA     COMMENTO

root.totale.0.19990505    709008800    99/05/05   19:11
cineca.totale.0.19990505  8016588512   99/05/05   21:01
serverinfm.totale.0.19990505 10531875616   99/05/05   23:19
serverincm.totale.0.19990505  2490255864   99/05/05   23:49
servercnaa.totale.0.19990505  5907826464   99/05/06   00:59
serveradamo.totale.0.19990506  8350278944   99/05/06   17:02
serverideas.totale.0.19990506  1079786592   99/05/06   17:39
------------------------------------------------------------------
```

KART volume content listing (2)

```
-----------------------------------------------------------------------
Mbytes totali:      >50000
Mbytes occupati:  35369
Mbytes liberi:      >14631
Proprietari :       operator
Flags       :        NR-
Residenza   :       SILO
ACL         :   NESSUNA
-----------------------

Dettaglio permessi volumi:
------------------------------------------

Proprietari               pr. rp  wp  Res.     Tipo           Volumi
------------------------  --- --- --- -------- -------------- --------
operator                   N   R   -  SILO     SD3C/50000Mb   XC0064
```

KART/TDB portability

- Original development environment: Unicos

- Basic I/O through specific C program optimized for best performance (block size, buffering)

- Unicos aware of block size factor for tape devices at library level

KART/TDB portability (2)

- Need to port to IRIX to access newly installed SCSI Redwood and Timberline units

- Some code/scripts remake necessary: IRIX not aware of block size for tape devices at library level

- dd was the only default I/O command that worked properly

KART/TDB portability (3)

- First try in May/June 1998 with beta TMF available
- Some minor problems with block size
- tmmnt instead of tpmnt
- One month test
- In production by September 1998 on the Origin2000

CINECA site configuration