

mxload

A Portable Package For Reading Multics Backup Tapes

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Data Migration

- **What is the problem?**
- **How is migration done today?**
- **How does mxload do better?**
- **Features of mxload**

Data Migration Situations

- **Wholesale move**
- **Move a single user/project**
- **Move specific files**
- **Selective retrieval**

Migration Techniques

- **Today's Solutions**
 - `backup_dump`
 - `tape_archive`
 - `tape_out`
 - `kermi t`
- **Migrate *from* Multics
not *to* other systems**
- **Common Drawbacks**
 - Special tape format
 - Losing Multics file attributes
 - Requiring explicit migration tape

Migration with mxload

- Uses standard `backup_dump` tapes
- Preserves Multics hierarchy structure
- Translates *to* other systems
- Supports all migration styles
- Does not require Multics system
 - Can use old `backup_dump` tapes

mxload Summary

- **mxload** **Load Multics hierarchy from tape**
- **mxmap** **Make map of tape**
- **mxarc** **Unpack archive**
- **mxmbx** **Unpack mailbox**
- **mxforum** **Unpack Forum meeting**
- **mxascii** **Convert ASCII segment**

mxload Interactive Style

- **Example: Reload a single user's hierarchy**

```
mxmap /dev/rmt0  
mxload /dev/rmt0 ' >udd>Project>Person' /usr/person
```

- Can reload directories, individual files
- Can optionally use a batch-style control file to adjust conversion defaults
- Use **mxmap** to locate data, then **mxload** to reload it

mxload Batch Style

- **Example: Reload a pre-planned set of directories**

```
mxload -c migration_plan.mxl /dev/rmt0
```

- **Control file specifies pathnames and translations**
 - Old Multics pathname \Rightarrow New pathname
 - Attribute mappings (Owner, ACL, etc.)
 - Adjust conversion defaults (for instance, leave archives for manual conversion)

mxload Features

- **Data format translation**
 - ASCII: 9-bit \Rightarrow 8-bit
 - Archives \Rightarrow directories
 - Mailboxes \Rightarrow files
 - Forum meetings \Rightarrow files
- **Attribute translation**
 - Person/Project \Rightarrow owner/group
 - ACL \Rightarrow permissions
- **Name translation**
 - Multics \Rightarrow UNIX names
 - Relocate hierarchies

Archive Conversion

- **Automatic for ASCII archives**
- **Manually with mxarc**
- **Common Options**
 - **mxarc -t** for table of contents
 - **mxarc -u** for to unpack completely
 - **mxarc -x** to extract individual archive components

Forum and Mailbox Conversion

- **Manually only**
 - `mxforum` for Forum meetings
 - `mxmbx` for mailboxes
- **Common Options**
 - `mxmbx -t` for table of contents
 - `mxmbx -u` to unpack into individual files, one for each message
 - `mxmbx -r` to re-pack into single file with all messages

Name Translation

- **Special Characters**

- $> \Rightarrow /$

- $/ \Rightarrow -$

- $' \Rightarrow -$

- $" \Rightarrow -$

- **Short Names**

- System V has maximum of 14 characters per name

- `mxload` truncates and makes unique with `#N` suffix

- Can cause problems with directories, especially archive directories

Input to mxload

- Normally a Multics `backup_dump` tape
- Also can be a file
 - Disk copy of tape file
 - If tape is hard to read
 - For more efficient random access
- Multics `backup_dump` file
 - Created with `backup_preattach`

Product Details

- **Available for UNIX[®] systems**
- **Readily Portable**
 - MS-DOS[®] version created by Oxford Systems for development purposes
 - VM/CMS[®] version created by by customer (with considerable difficulty due to VM/CMS idiosyncracies)
- **Available today**

Customer Experience

- **Universities of Bath and Bristol**
 - Generic 4.2 BSD version on Gould NP1
 - Special CMS version on IBM 3090
 - Complete migration from Multics to other systems
- **Massachusetts Institute of Technology**
 - Generic 4.2BSD version on DEC Ultrix
 - Archival recovery only, no Multics available
- **Bull HN (Billerica)**
 - Generic System V version on XPS-100
 - For migration from BCO–Multics