UNIX PORTABILITY CHANGES IN V8.4

Rupesh Shantamurty
OpenVMS Engineering

AGENDA

– Overview of Unix Portability Initiative

– Semaphores

– UTF-8 support

– GNV Update

– Q & A

UNIX PORTABILITY - OVERVIEW

UNIX PORTABILITY INITIATIVE

OBJECTIVE

- Ease Porting of applications from UNIX, LINUX and Open Source to OpenVMS

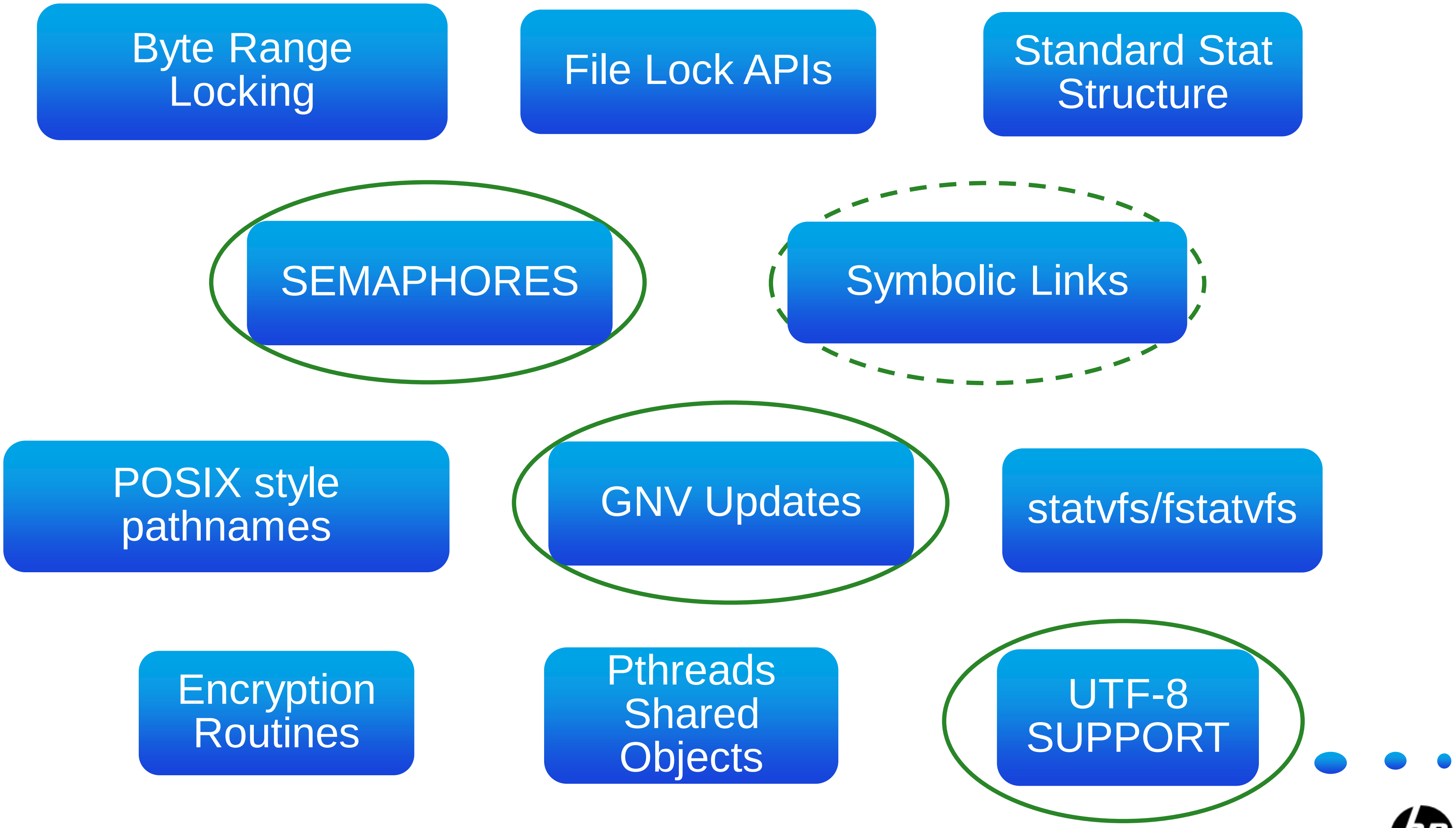
GOAL

- OpenVMS will be like any other “UNIX flavor” for easy application portability
- Cost of porting from UNIX to OpenVMS is comparable to porting one "flavor" of UNIX to another

BENEFIT

- Less OpenVMS development cost
- Enhanced application portfolio on OpenVMS, including Open Source applications
- Familiar UNIX-style development environment

RECENT DEVELOPMENTS & V8.4



- Byte Range Locking
- File Lock APIs
- Standard Stat Structure
- SEMAPHORES
- Symbolic Links
- POSIX style pathnames
- GNV Updates
- statvfs/fstatvfs
- Encryption Routines
- Pthreads Shared Objects
- UTF-8 SUPPORT

SEMAPHORES

INTRODUCTION - SEMAPHORES

Semaphores - Inter Process Communication mechanism for synchronization across multiple processes.

– System V Semaphores

– POSIX Semaphores

NEED FOR SEMAPHORES ON OPENVMS

PRE V8.4

- Semaphore API implementation was not available
- Implement emulator solutions
- Performance issues due to layered emulator solutions

SOLUTION IN V8.4

✓ Implements Semaphore APIs

✓ Applications using semaphores can be ported without code change

IMPACT

✓Reduces porting time
✓ Reduces cost of porting
✓ Facilitates porting of other Open Source applications to OpenVMS

SYSTEM V SEMAPHORE API

ftok()	Generates a standard inter process communication key
semget()	**Gets a set of semaphores**
semop()	**Performs operations on semaphores in a semaphore set**
semctl()	**Semaphore control operations**

POSIX SEMAPHORE API

sem_open()	Opens/creates a named semaphore for use by a process.
sem_init()	Initializes an unnamed semaphore
sem_getvalue()	Gets the value of a specified semaphore.
sem_wait()	Performs a semaphore lock.
sem_trywait()	Conditionally performs a semaphore lock
sem_timedwait()	Performs a semaphore lock by waiting for a specified time.
sem_post()	Unlocks a semaphore.
sem_unlink()	Removes the specified named semaphore.
sem_destroy()	Destroys an unnamed semaphore.
sem_close()	De-allocates the specified named semaphore.

USING SEMAPHORE API

Application programs need to include the following header files

- POSIX SEMAPHORE:

#include<semaphore.h>

- System V SEMAPHORE:

#include <sys/ipc.h>

#include <sys/sem.h>

CONSIDERATIONS

- System V Semaphores:
  - Maximum number of semaphore sets allowed on a system is 1024
  - Maximum value of a semaphore is 32767
  - Maximum number of SEM_UNDO operations allowed for a process is 1024.
  - No support for IPC_PRIVATE

- POSIX Semaphores:
  - Unnamed semaphores not supported across processes

UTF-8 SUPPORT

INTRODUCTION –UTF-8

- UTF-8 (8-bit Unicode Transformation Format) is a variable-length character encoding for Unicode.
- UTF-8 can represent any character in the Unicode standard.
- UTF-8 is becoming the preferred encoding for e-mail, web pages.

CRTL APIS SUPPORTING UTF-8

- mkdir()
- opendir()
- rmdir()
- creat()
- open()
- rename()
- link()
- stat()
- chdir()
- chmod()
- chown()
- readdir()
- fopen()

NEED FOR UTF-8 SUPPORT

PRE V8.4

- UTF-8 character-set support was not available

SOLUTION IN V8.4

✓ Support UTF-8 character-set with CRTL APIs

✓ Applications requiring this feature can be ported without code changes

IMPACT

✓CRTL APIs support UTF-8 file format specification

✓E.g. CIFS support with Japanese OpenVMS

USING UTF-8 SUPPORT

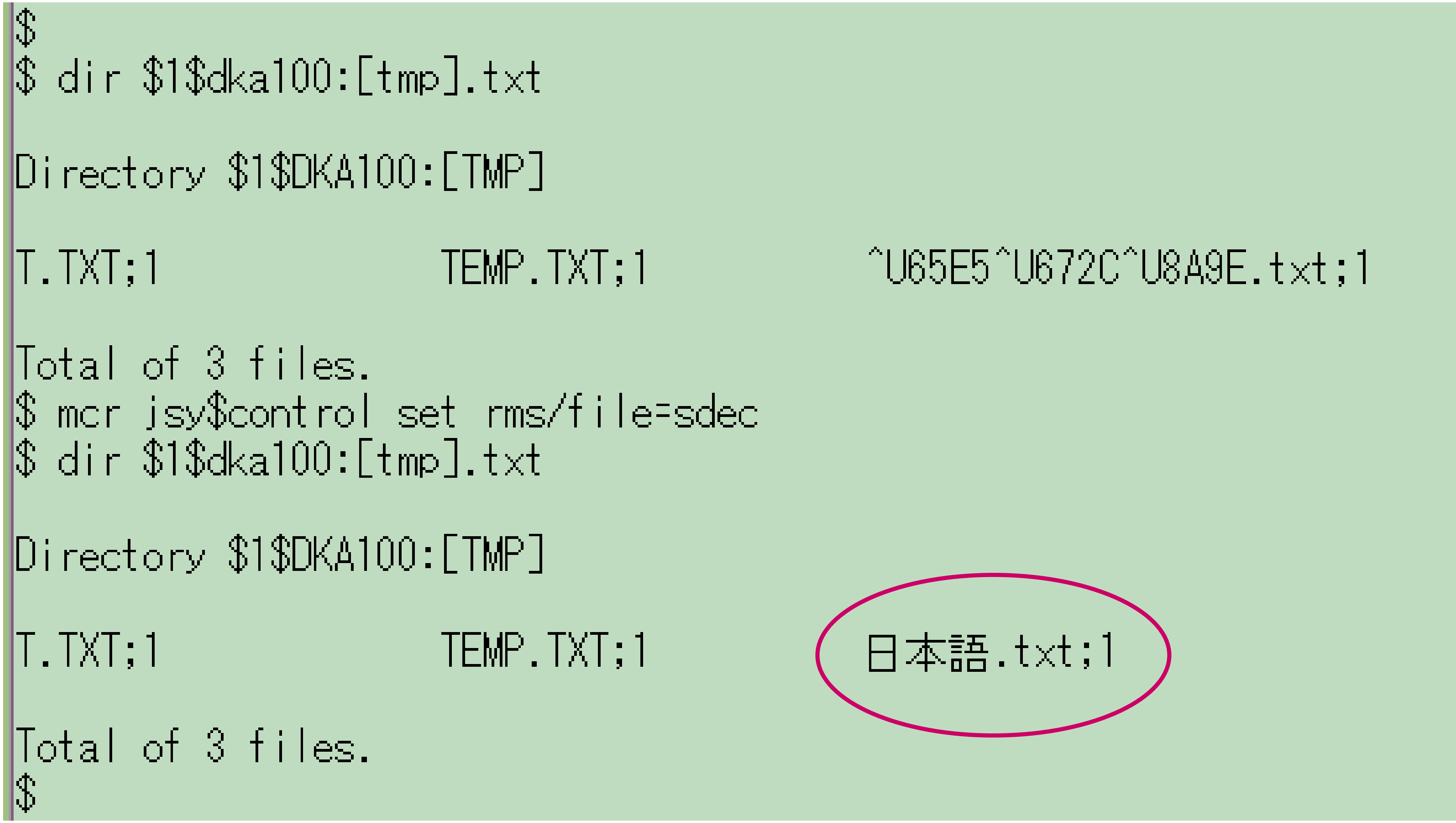
- $DEFINE / SYSTEM -

  $_ **DECC$FILENAME_ENCODING_UTF8** “ENABLE”

- $DEFINE / SYSTEM DECC$EFS_CHARSET “ENABLE”

- Requirement: ODS-5 disk

EXAMPLE USAGE OF UTF-8 SUPPORT



```
$
$ dir $1$dka100:[tmp].txt

Directory $1$DKA100:[TMP]

T.TXT;1             TEMP.TXT;1          ^U65E5^U672C^U8A9E.txt;1

Total of 3 files.
$ mcr jsy$control set rms/file=sdec
$ dir $1$dka100:[tmp].txt

Directory $1$DKA100:[TMP]

T.TXT;1             TEMP.TXT;1          日本語.txt;1

Total of 3 files.
$
```

GNV

GNV V2.1-3

- Available @ Sourceforge
- Changes :
  - ✓Support for Symlink Capability –> ln -s
  - ✓Installation changes
    - ❖Stability in setting up Mount Point
    - ❖Mixed Architecture Environments – Configuration files
  - ✓Bash – Command recall
  - ✓Improvements in cc wrapper
  - ✓mnt – improvement in record keeping

GNV V2.1-3 – CALL TO ACTION

– Community Participation is key

– Want to contribute to GNV Project

  - Subscribe to the mailing list: https://lists.sourceforge.net/lists/listinfo/gnv-develop

– Want to be part of GNV Developer Team

  - send a mail to -> hp-gnv-devlp@users.sourceforge.net

Q&A