Microware OS-9 Release Notes

Version 4.2

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Contents

1 Introduction

Microware OS-9 version 4.2 represents a maintenance and update release to incorporate all of the improvements that have been introduced into the component parts.

PowerPC Users:
The previous release of OS-9 for PowerPC was version 3.2. Refer to *Microware OS-9 Release Notes* document, versions 4.0 and 4.1, for important information about updates for those versions of OS-9.

Non-PowerPC Users:
This release only includes updates for the PowerPC processors. For information on the latest enhancements to OS-9 for other processors, refer to the following documentation:

- For ARM and SH-4, refer to *Microware OS-9 Release Notes* v4.1 and v4.0.
- For IXP1200, refer to *Microware OS-9 Release Notes v4.0*.
- For MIPS, SH-3, or x86, refer to *Microware OS-9 Release Notes v3.2*.

In addition, it is recommended that you read the release notes from your previous version of OS-9 in conjunction with the notes for the current release.

The following list describes the major enhancements that were made to OS-9 for this release:

- Updated Network Functionality

  The TCP/IP stack now supports both IP version 4 and IP version 6.

- Hawk and the Hawk Debugger

  The Hawk application has been enhanced for more efficient host/target communication.

2 Operating System

This chapter provides an overview of the changes and improvements made to OS-9 since the last release. The following sections are included:

- Resolved Problems

Resolved Problems

The following section gives a description of Customer First incidents related to the OS-9 operating system and how they were resolved for the current release.

- CF14104: Some SCF drivers unintentionally clear pending error conditions.

  Previously, a series of SCF device drivers were explicitly setting the `v_err` field of the logical unit static storage options section. They are now correctly performing an "or" operation of any errors into the `v_err` field. The drivers affected by this problem are `sc16450/sc16550`, `sc3927`, `sc555`, `sc68681`, `sc7708`, `sc7709`, `sc7750`, `sc85x30`, `sc9730`, `sccpm`, `schost`, `scscish4`, and `scspu`.

- CF14269: OS-9 can leave a nearly terminated process on the system.

  The kernel has been fixed so that if a thread calls `_os_exit()` after the main thread has already terminated, the main thread will appear terminated for its parent process and both the process descriptor for the child thread and the main thread will be returned to the free memory pool.

- CF14472: A process cannot be waited on if it is an orphan thread descriptor.

  The kernel has been fixed so that a parent process can successfully call `_os_waitid()` for its child process even if the main thread of the child process is an orphan thread, but not orphan process.

- CF14586: The kernel can crash when threads terminates.

  The kernel no longer crashes when the order of thread termination is disturbed by I/O blocking issues.

- CF15003: The `_os_ss_size()` function of a file that is open by another process can lead to the error message 000:213 on next write.

  Previously, the "wait" option for EOF was blocked during when using the `_os_ss_size()` function. RBF has been updated to correct this issue.

- CF15080: The low-level PC Card booting software cannot handle PC Cards formatted with Windows XP.

  Windows XP formats Flash disk PC Cards it reserved 6 sectors instead of the normal 1. The low-level PC format disk handler (`pcman`) was assuming that PC cards always only had 1 reserved sector. This problem has been corrected.

- CF15141: Updates are needed for `dbgextns`.

  OS-9 for 68K: Edition 7 of `dbgextns` permits memory in the process descriptor fragment list as well as the SSM map.

  OS-9: A user-state version of `_os_chkmem()` has been added to allow the Debugger to read and write memory properly when attached to a module (rather than fork). This requires edition 173 of the kernel and edition 73 of `spfndpdc`.

- CF15149: The trap handler installed by `_os_strap` does not have access to all registers.

  The OS-9 kernel has been enhanced to provide values of all modified registers to the strap trap handler via variable arguments. The exact format of the variable arguments differs on a per-processor basis, but they generally provide the stack pointer and the first three parameter registers to the exception handler.

- CF15214: Update 16550 driver to properly handle buffer overrun.

  Previously, the 16550 driver overwrote the data buffer when no more room was available in the buffer. This problem has been corrected.

- CF15313: `_os_srqmem()` from user-state can leave large amounts of memory allocated.

  The OS-9 kernel has been fixed to ensure that if SSM returns an error from the `F_PERMIT` call for an allocation, the allocation is returned to the system. Previously, the memory remained allocated, but an error was returned from the `_os_srqmem()` system call.

3 Processor-Specific Notes

This chapter provides an overview of processor-specific enhancements and modifications for Microware OS-9 version 4.2.

 The following sections are included in this chapter:

* PowerPC Notes

PowerPC Notes

The following sections represent changes and updates to OS-9 for the current version of PowerPC.

Enhancements

This section describes enhancements made to OS-9 for PowerPC since the last release.

- CF14414: The Wizard `.ini` files need updating for PPC.

    The `.ini` files have been updated. The Wizard no longer includes all of the files into any bootfile it creates, as it did previously.

Resolved Problems

This section provides a list of PowerPC-related Customer First (CF) incidents and how they were resolved for the current release.

- CF2770: `sp1577` should return `EHOSTUNREACH` instead of `ENETUNREACH`.

    `sp1577` has been changed to return `EHOSTUNREACH` in each place that it previously returned `ENETUNREACH`.

- CF12812: RomBug on the 823 FADS board reports a 103:004 error.

    The low-level debugger entry/exit code has been fixed to correctly restore the memory management registers such that the `break` utility can access its own executable code.

- CF12899: The following modifications are needed to support removable medias (optical drives) with the `rbsccs` in OS-9:

    1. If no media is inserted, a EOS_NOTRDY is returned.

    2. If the media is write protected, an EOS_WP is returned if you try to write.

    3. After a media change, an EOS_DIDC is returned.

    4. If FMT_REMOVABLE is set in the device descriptor, the caching for sector 0 is off.

    All of these items are now included in the OS-9 code base.

- CF12968: The 405GPEVB port needs updating to not hardcode MAC address.

    The SPF MAC address and fixed descriptor name have been updated to display in the Wizard.

- CF14103: `SS_LUOPT` writes the `v_err` flag.

    SCF has been fixed in edition 33; it no longer copies the specified `v_err` from logical unit options.

- CF14402: SSM for the PowerPC 823 and 850 boards can corrupt the data cache during TLB updates.

SSM has been modified so that it no longer corrupts the data cache by manipulating individual TLBs during TLB updates. Instead, SSM now invalidates all TLB entries with translation off.

- CF14681: The `sccpm` driver sends 0x93 instead of 0x13 for XOFF.

  The `sccpm` driver has been corrected to properly send 0x13 for XOFF. Previously, it was sending 0x13 with an internal flag bit (0x80). It now clears the flag prior to sending the character.

- CF14777: Data is getting lost for the `sccpm` driver (860 board).

  When using baud rates of 38400 or greater, the `cpm` serial driver drops characters. The low-level and high-level drivers were modified to resolve this.

- CF14982: HawkEye crashes with PowerPC.

  Using HawkEye with a PowerPC platform with software floating-point no longer crashes the target system when floating-point operations are performed. The `fpu` emulation module had several incompatibilities in the way it was making system calls that caused HawkEye's monitoring software (`slm`) to crash in system-state. HawkEye no longer fails to take a snapshot of a system running with module directories. Previously, the router program was sending module directory entries to the HawkEye client as if they were modules. `router` no longer sends any information about module directories.

- CF15162: Using `cache750` without `ssm` throws away memory.

  The cache modules for the 604 and 750 boards now set up a default page table with all invalid entries to avoid accidentally accessing the wrong memory address. In addition, `ssm` has been updated to enable translation on DSI or ISI exception.

- CF15163: `inline` is redefined as a global symbol.

  Previously, `cdefs.h` redefined `inline` as a global symbol by the `cdefs.h` file in `MWOS/SRC/DEFS/SPF/BSD<4>/sys`. The `cdefs.h` file has been updated to resolve this issue.

- CF15181: SCCPM does not correctly handle the SMC2 for the 850 and 823 boards.

  The source code has been modified to read from the control registers with 16-bit reads instead of the incorrect 32-bit reads.

- CF15386: On the MCP750 board, the `telnet open` command does not work; it displays the error, 007:005 (message too long).

  The command line parser for the open command in the `telnet` command mode was fixed to properly specify the target port number if none is given. In addition, it now accepts and discards whitespace in all places.

- CF15490: The `spfe0`, 100Mb driver does not support packet chains.

  Support for packet chaining has been added. The new stack requires the driver to support packet chaining. The driver `SPETHPQ2` (`entry.c`) has been modified.

4 Host Applications

This chapter contains release notes for host applications used with OS-9 v4.2. The following sections are included:

- Configuration Wizard Notes
- Hawk Notes

Configuration Wizard Notes

The following sections represent changes and updates for the Configuration Wizard.

Enhancements

The following list describes the general enhancements made to the Configuration Wizard since the last release. Where applicable, Customer First (CF) incidents are included.

* CF11668: A system time zone enhancement is needed.

  On the `init` module customization screen, there is now a drop-down box that enables you to select the time zone. The proper offset will be placed in the offset box. In addition, the **System Offset** button has been changed. It is now called **Get offset from Wizard host**.

Resolved Problems

This section provides a list of Customer First incidents related to the Configuration Wizard and how they were resolved for the current release.

* CF7969: When there are no disk peripherals on a port, the low level disk button in the Wizard is not grayed out.

  Previously, this button did not serve any function because an option was already set in the `.ini` file to tell the Wizard that there are not any disk peripherals.

  The Wizard has been updated so that when there are no disk peripherals on a port, the low-level disk button in the wizard will be disabled.

* CF13863: The Wizard's **Softstax Setup** tab contains broken buttons and inaccurate IPv6 information.

  Edition 2.19 of the Configuration Wizard contains enhancements that fix this problem.

* CF14181: It is possible to select MAUI Options when MAUI is not supported.

  This problem has been corrected. If the code states, "MAUI=FALSE" under "[SUPPORTED_MODULES]", no MAUI options tab will appear in the **Configure System Options** dialog.

* CF14190: Setting `tftpboot` as auto booter resets all `tftpboot` parameters.

  `tftpboot` parameters no longer reset when check boxes are selected.

* CF14286: The Wizard does not accept IPv6 addresses.

  The statement, "Disallow site-local outgoing without scope id for host" was removed from `os9.c`.

* CF15533: The Wizard loads and saves configurations too slowly.

  The Wizard has been enhanced to internally cache configuration (`.ini`) files instead of repeatedly rewriting them.

- CF14398: The Wizard puts `ndbmod` in `init` string when not using DHCP.

    The Wizard was putting `ndbmod` into the init string when `rtsol` was used to get an IPv6 address. This problem has been fixed.

- CF15447: Wizard does not stop building a boot when asked.

    Previously, if a file was missing from one of your `.ml` files, the Wizard would ask if you wanted to continue to build the boot without the module. If you selected "No," it continued as if you had said "Yes."

    As of edition 150 of the Wizard, a more helpful status message appears and the Wizard aborts much faster.

- CF15455: The Wizard fails to notify of missing module.

    In edition 122 of the Wizard, a change was made that resulted in an abort of the build without informing you if the `bootfile.ml` contained an file that could not be found. In edition 150, if a a file cannot be found in any `.ml` file, the Wizard will ask you if you want to ignore the error or abort the build. In addition, the abort response results in a faster abort and better error message than in the past.

Hawk Notes

The following sections represent changes and updates to Hawk since the last release.

Enhancements

The following list describes the general enhancements made to Hawk for the current release. Where applicable, Customer First incidents are included.

- CF13004: Enhancement needed for Hawk and memory directories.

    `Hawkdbg.dll` and `hawkdbgr.exe` have been updated. Hawk now contains an edit box that allows you to input a module directory to load a module into on both the **Load** dialog and the load portion of the **Connect** dialog.

    Also, edition 71 of `spfndpdc` was modified. If an older version of `spfndpdc` is used and you specify a module directory in which to load a module, the module will be placed in the root directory.

- CF14012: Add watches in the Debugger via **Watch** window.

    This enhancement has been made.

- CF15153: Hawk GUI cannot specify the same library twice.

    Hawk has been enhanced to allow the same library to be selected twice.

Resolved Problems

This section provides a list of Hawk-specific Customer First incidents and how they were resolved for the current release.

- CF5720: Editing the `.mpj` file of a closed project can cause a source file corruption.

  The source file is no longer corrupted. In the current version of Hawk, when you save a project with the `.mpj` file open in the editor, the dialog will now state that the file was changed by and external process and ask you to either reload the file or save it as another name.

- CF5723: The **Build** window does not get cleared when **Close** is selected from the **Project** menu.

  Hawk has been updated so that the errors in the **Build** window are cleared before each build. Therefore, if there are errors in a new project and you perform a build, the previous errors will be cleared before any of the new projects errors are displayed. The errors can also be cleared at any time by doing a right click in the output window and selecting **Clear Error File** from the pop-up list.

- CF14261: An access violation occurs when you right-click in the Add Watch window in the Hawk Debugger.

  A check has been added to avoid this problem; the pop-up menu now appears and items can be added to the window using the Insert menu item.

- CF14305: The Advanced button does not work properly in the Version Control Setup dialog.

  A patch has been included into the current version of Hawk that fixes this problem.

- CF14057: There is no error when an attempt is made to load non-existing files.

  Previously, when a target load was performed, the error message was not descriptive enough for incorrectly input filenames. Currently, in the case that the load fails, a check is done to see if the filename the user input exists. If the file does not exist, the message, "Module: <ModuleNameEditBox->Text> could not be found" will display.

- CF14079: The Hawk Debugger bus traps when adding first watch entry.

  This problem has been resolved; the bus trap no longer occurs.

- CF14662: Hawk does not allow debugging if a project path contains spaces.

  Previously, Hawk would not allow debugging if the pathname to the module to be debugged contained a space. This has been fixed.

- CF14847: The Hawk Debugger crashes when setting breakpoints in files with a long pathname.

  Previously, Hawk did not operate successfully if the pathname was too long on a source filename. This problem has been resolved in `hawkdbg.dll` and `hawkdbgr.exe`.

- CF15025: A system-state debugging error, "Invalid class typecast," occurs when changing mem value.

  This problem has been resolved.

- CF15062: Cannot step out of a signal handler.

  In the previous version of Hawk, it was not possible to step out of a signal handler to the source line that was interrupted by the incoming signal. It is now possible to return from a signal handler with the following caveats:

  1. If you use `_os_intercept()` to install the handler, you must step over the `_os_rte()`.

  2. If you use `intercept()` or `signal()`, the "step next", "step source", and "return from function" options will all work properly.

Known Issues

- CF14222: The Hawk Debugger only allows nine paths to source code directories.

  All of the Borland controls suffer from the same limitation when it comes to the length of a string that can be saved. Refer to the Borland help file for a description of this problem.

5 Components

This chapter contains processor-independent release notes for OS-9 components. It includes the following sections:

- OS-9 Compiler Notes
- Networking Notes
- OS-9 Utilities Notes
- MAUI Notes
- Add-Ons

OS-9 Compiler Notes

The following sections contain release notes for the OS-9 Compiler.

Enhancements

- CF8155: XCC: Better makefile-compatible dependency generation is needed.

  Dependency generation in Ultra C/C++ is not adequate. The Ultra C/C++ Compiler has been enhanced to emit makefile dependencies that can now be used in an `os9make` makefile. Refer to the documentation for the `-pm` option in the *Using Ultra C/C++* manual for more information.

Resolved Problems

This section gives a description of Customer First (CF) incidents related to the Compiler and how they were resolved for the current release.

- CF10556: The `__obj_assign()` function is not properly recognized by the Compiler.

  The Compiler generated an "uninitialized" warning for the variable passed in `__obj_assign()`. This problem has been resolved in edition 46 of `cpfe`.

- CF12466: `fstream` file open fails with EINVAL for read and write files.

  This problem has been corrected. The problem stemmed from the differences between UNIX and OS-9 `o_xxx` modes.

- CF13838: There is an internal error in Compiler.

  Previously, the C/C++ front-end contained an internal error under certain circumstances when processing C++ code. The internal error resulted from an infrequent instance of circular data types. This problem has been resolved.

- CF14182: I-code-linked threaded applications can have stack recursion problems.

  This problem has been corrected.

- CF14803: The Hawk Debugger cannot display types that are not directly used in a source file.

  The Ultra C/C++ Compiler front-end was modified to ensure that all type information is copied to the `.dbg`, regardless of whether or not the compiled source file used the type. This can lead to larger `.dbg` files, but they have enhanced type visibility.

- CF15078: `__rwstd::__stl_tree_mutex` unresolved in threading C++ standard library.

  The threading C++ standard library (`mt_cplib`) now correctly resolves `__rwstd::__stl_tree_mutex`.

- CF15140: `strftime()` does not handle the specified buffer size correctly.

  `strftime()` has been fixed to ensure that it correctly returns zero when the specified buffer size is insufficient for the number of characters generated. Previously, it could overwrite data appearing beyond the end of the specified buffer size.

- CF15161: Ultra C can have problems with complex right-shift expressions involving constants.

  If this expression involving the integer x:

      (short)(x >> 16) >> 8

  was seen by the I-code optimizer, it was translated into the following expression:

      (short)x >> 24

  This is not a correct transformation since information for the right-shift is lost by the cast of x to short. This problem has been corrected.

- CF15235: `snprintf()` and `vsnprintf()` do not handle threading well.

  `snprintf()` and `vsnprintf()` have been re-implemented to handle threading correctly. They now correctly use locks and do not overwrite any I/O data structures that other threads might be using.

Networking Notes

The following sections include the release notes for the current versions of SoftStax and LAN Communications.

Enhancements

The following list describes general enhancements made to SoftStax and Lan Communications for this release. Where applicable, Customer First incidents are included.

- CF13945: Add FTP support.

  `rt_msg_sdl_index_update()` was added into SPIP edition 70.

- CF14129: Insert hardware address from `spenet` into the route table.

  This enhancement has been made. Now, when SPIP receives `RTM_ADD` via `IP_SS_RTMSG`, it adds a host route entry in its route table and use the hardware address instead of IPv4 address to send mbuf to spenet. SPIP removes a host route entry when it receives `RTM_DELETE` via `IP_SS_RTMSG`.

- CF14354: Add multicast packet routing support for IPv4.

  This enhancement has been made in edition 8 of `netstat`, edition 82 of `spip`, and edition 16 of `spraw`.

- CF15086: TCP/IP eliminates predictable multi-tasking response times.

  TCP/IP is now processing regularly; it now operates with an extremely small time interval while the network is running. The software preemption depends on tick rate.

- CF15237: `sysmbuf` is not saving or restoring all 32 bits of the status register.

  The OS-9 module `sysmbuf`, in an attempt to mask interrupts, was failing to save and restore the upper 16 bits of the machine's status register. This problem has been resolved.

- CF15244: `nfsc` can corrupt memory when UID/GID mappings are used.

  `nfsc` has been updated to create a data module of the appropriate size when UID/GID mappings are used. Previously, the created data module was small, which could have lead to corruption of nearby memory.

- CF15261: Add support for `blksize` and `tsize` in `tftp`.

  To improve download performance, `tftp` has been enhanced to support `blksize` and `tsize` as described by *RFC 2347*. The `blksize` command allows larger or smaller blocks of data. Larger blocks are an advantage when few, if any, blocks have to be retransmitted. Use the `tsize` command when you get files to pre-allocate the disk space, which improves the speed of the writes. This enhancement is valid starting with edition 2 of `tftp`.

- CF15367, 15397: Add support for block sizes to `tftpd` that are greater than 1428.

  In edition 215 of `tftpd`, the following updates have been made to resolve this issue:

  1. The block size limit has been increased from 1428 to 8192.

  2. `tftpd` has been modified to allocate the memory buffers dynamically, rather than strictly to conserve memory.

  3. `tftpd` has been modified to use `memcpy` instead of byte copies in binary mode, allowing for faster transfers.

Resolved Problems

This section discusses problems that were resolved for SoftStax and LAN Communications. Where applicable, Customer First incidents are included:

- CF13932: `beam` fails with an exception.

  This problem has been corrected; additional stack size has been added.

- CF13576: `ping6` needs updated `Devsendmsg()` and `recvmsg()` functions.

  Edition 4 of `ping6` uses `sendmsg()` and `recvmsg()` in the socket library.

- CF13850: RealTek 8139 is always promiscuous.

  The RealTek 8139 Ethernet driver was fixed to start in unicast mode instead of promiscuous mode. In addition, it was fixed to not go into promiscuous mode until necessary.

- CF14142: Local name resolution does not work without DNS servers configured.

  The local name resolution now works even if DNS are not configured; this update is located in `gethnamaddr.c`.

- CF14209: `route6d` can only be started with `-d` option.

  The command option check has been removed and the stack size has been increased. This resolution is included in `route6d.c` and makefile, `route6d` edition 5.

- CF14212: The `route` display hangs the system.

  When the path is closed, per-path-storage memory returns to the system. However, `os9_pp` is still in the socket that is pointing to that memory. When the packet moves to that socket, it attempts to send according to the released per-path-storage. `del_pp()` cleans up the socket's `os9_pp` and `do_updata()` does not send packet if there is no per-path-storage associated with it. These changes are reflected in edition 18 of `sptcp`, edition 16 of `spudp`, edition 11 of `sproute`, and edition 14 of `spraw`.

- CF14335: IPv6 does support all "1's" broadcast.

  Instead of implementing all "1's" broadcast in the network stack, applications can now send raw packets to an interface of their choice.

- CF14449: A problem in `fmstart.r` causes SPF to crash the system.

  Previously, when entering the `__DeInitFM` function of the SPF, the system crashed just before the `__RmDevlist` call. This happened because the test for a valid pointer was not done. Code has now been added to check to make sure that the pointer is valid.

- CF14896: `route` information does not update after reconnecting to the existing interface.

  After establishing routes with two interfaces, one interface was disconnected. Soon, the routes updated to use the other interface. However, when the disconnected interface was reconnected, the route information did not recover.

- CF15096: The NFS file manager leaks memory on aborted delete requests.

  The OS-9 for 68K and OS-9 NFS file managers have been fixed to no longer leak memory on aborted delete requests. Generally, delete requests abort when the target file is open by a process on the mounted machine.

- CF15109: Problem with IPv6 version of FTPDC passwords.

  This problem has been fixed in edition 14 of `ftpdc`. You must use the latest version of `netdb` for this resolution to apply.

Known Issues

This section describes the known networking issues that exist for this release. Workarounds are provided, where possible.

- CF14650: Networking is needed to support SS_RELEASE setstat.

  Edition 36 or later of ioman is required for thread support of SoftStax, due to non-last path close() call.

OS-9 Utilities Notes

The following section represents changes and updates to OS-9 utilities for this release.

Resolved Problems

This section describes Customer First incidents related to the OS-9 utilities and how they were resolved for the current release.

- CF13943: The dir command shows invalid entries on PCF/FAT files.

  The dir utility now prints a warning if the checksum of the 8.3 name does not match the LFN record. This is an indication that the file system is inconsistent due to media error or is being modified by an operating system capable of supporting non-long file names.

- CF13944: The dir command continues the directory search after a NULL entry.

  Previously, the stdio buffer was flushed between every entry; this caused excessive I/O occurrences. This has been corrected in edition 66; the dir command is now faster for PCF directory listings.

- CF14340: Utilities sometimes ignore last line of -z input file if no EOL.

  Utilities with the -z options have been updated to correct this problem.

- CF14147: mdir shows module directories when it is only supposed to show modules of a particular type.

  This problem has been fixed.

- CF14234: format does not handle the <Esc> key well at the prompt.

  The ynans function has been fixed so that input of escape does not cause an endless loop.

- CF14839: fsave crashes on long and deep directory trees.

  Previously, fsave was only saving 80 characters or less to the backup-records file (in this example, backup_dates) and then only reading 80 characters or less the next time fsave was run. This was causing the second iteration of fsave to look for a directory that did not exist.

  Edition 34 of fsave has been updated. The size of pathnames has been increased to 800 characters for reading to the record, writing to the record, and printing to the screen.

- CF15120: the `popen()` utility does not work correctly in all situations.

    The `popen()` utility in `unix.l` has been rewritten to operate more similarly to the `popen()` found in mainstream operating systems.

MAUI Notes

The following sections contain release notes for MAUI.

Enhancements

- CF15380: The MAUI Graphics driver `gx_cl543` does not support extended device capabilities.

    Support has been added for extended device capabilities to the MAUI Graphics driver `gx_cl543`. This data is retrieved via the `gfx_get_dev_capexten()` call.

Resolved Problems

This section gives a description of Customer First (CF) incidents related to MAUI and how they were resolved for the current release.

- CF 14581: `winink maui` demo problems.

    The `winink` demo has problems coinciding its window area with its drawing area. This problem manifests itself in various ways such as being able to ink onto the window manager or other windows.

Known Issues

This section describes the known MAUI issues that exist for this release. Workarounds are provided, where possible.

Add-Ons

This section describes the enhancements, resolved problems, and known issues for the add-on products in this release. Customer First incidents and workarounds are provided, where applicable.

USB Notes

- CF14188: The "drag-and-drop to load modules" option included with Hawk View fails for USB peripheral.

    Previously, the default directory transferring the file to the target was not found unless `/dd` was specified on the target. This caused a "File could not be created error" in some cases. Code has been added to perform a search for the current working directory on the target and use the directory found as a destination for the file.

Java Notes

- CF15072: Exception executing `mw.mawt.MAWTFontMetrics.charsWidth()`.

  The Pjava `classes.zip` file has been modified so that `mw.mawt.MAWTFontMetrics.charsWidth()` no longer receives an exception when faced with a unicode character greater than 255.

- CF15185: PJava can sometimes stop updating the screen due to expose events.

  Previously, if threads were drawing with MAUI calls and the garbage collector was running when graphics objects were being finalized, PJava appeared to stop running. This problem has been corrected.

- CF15249: Some components are re-drawn unnecessarily upon focus receiving.

  The widget library has been modified; it no longer invalidates a widget when it receives focus. Instead, it responds to a flag that indicates that "invalidates" are not required on focus changes.

SNMP Notes

- CF15501: Building the Log example MIB for SNMPv2 causes the following linker errors. The Log example MIB for SNMPv2 is the only example MIB effected by this problem.

```
linker: error - symbol 'CopyLogMessage'
        unresolved, referenced by 'logq.c'.
linker: error - symbol 'FreeLogMessage'
        unresolved, referenced by 'logq.c'.
linker: error - symbol 'GetLogBook'
        unresolved, referenced by 'logq.c'.
linker: error - symbol 'dsender'
        unresolved, referenced by 'logq.c'.
linker: error - symbol 'GetLogLevel'
        unresolved, referenced by 'k_logo.c'.
linker: error - symbol 'SetLogFunction'
        unresolved, referenced by 'k_logo.c'.
linker: error - symbol 'SetLogLevel'
        unresolved, referenced by 'k_logo.c'.
linker: error - symbol 'SetLogUserData'
        unresolved, referenced by 'k_logo.c'.
linker: error - symbol 'TestLogMessages'
        unresolved, referenced by 'k_logo.c'.
linker: **** fatal - errors encountered
*** Error code 1
```

  The linker errors are caused by missing symbols in the `libsnmp.l` library. To add these symbols, modify the `\mwos\SRC\SPF\SNMPLITE\src\common-v1c.tpl` to define DEBUG as SR_DEBUG as follows, then rebuild the libraries using `bmake`:

```
DEBUG = -DSR_DEBUG
```