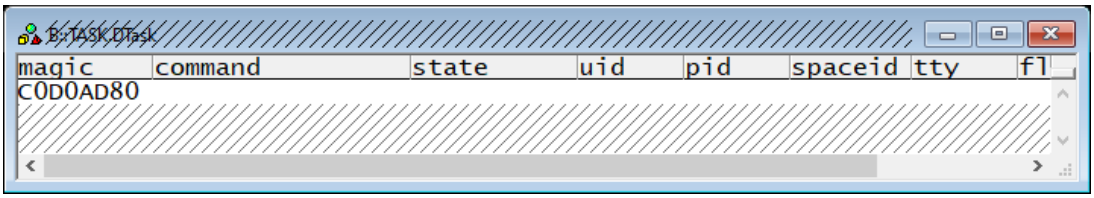
[Linux] Troubleshooting an awareness problem

2025-04-02 - Comments (0) - OS-aware debugging

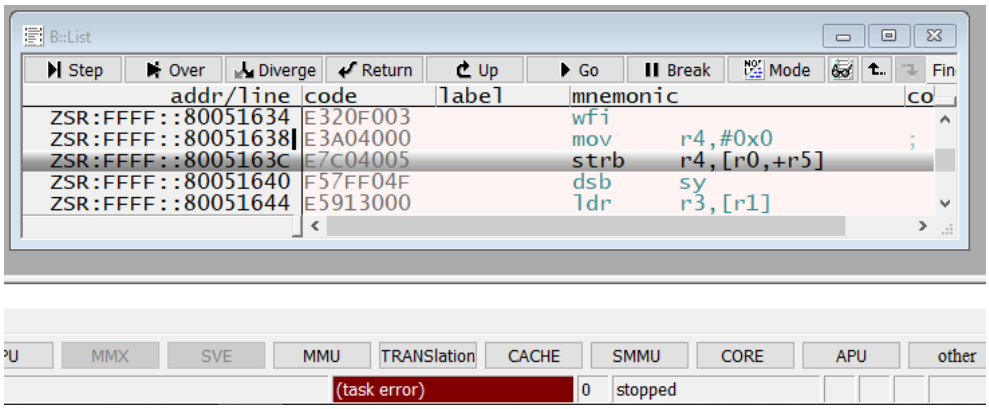
If you encounter issues with the Linux awareness setup, consider the following troubleshooting steps:

Symptoms of Awareness Issues

- Some or all awareness windows (e.g., `TASK.DTask`, `TASK.Process`) show errors or appear hatched.



- The current task is not displayed while the target is stopped after Linux has booted. Instead, you see errors such as `"(task error)"` or `"(other)"`. Moreover, the `List` window shows the space-ID `0xFFFF`.



Possible Causes and Solutions

1. Kernel Configuration Issues

Ensure that the kernel is configured correctly. Common causes include:

- Missing the kernel option **"Compile the kernel with debug info"** (`CONFIG_DEBUG_INFO`).
- Enabling **"Reduce debugging information"** (`CONFIG_DEBUG_REDUCED`), which should be avoided.
- Randomization caused by `CONFIG_RANDOMIZE_BASE` or `CONFIG_RANDSTRUCT_FULL`. Both options should be avoided.

For more details, refer to the “Kernel Configuration” chapter in Training Linux Debugging.

2. Translation Issues

Try disabling the translation with:

```
TRANSlation.OFF
```

If this improves the results, the issue may be related to incorrect translation settings.

An auto-detection scripts for translation settings is available for Arm under:

```
~~/demo/arm/kernel/linux/board/generic-template/detect_translation.cmm
```

Important: Read the script header carefully. If the script returns an error, contact technical support by opening a new ticket.

3. Kernel Mismatch Issues

Verify that the loaded `vmlinux` file matches the running kernel:

Check if the loaded vmlinux matches the executed kernel binary:

- Retrieve the target Linux banner by executing the command **`cat /proc/version`** in the terminal window
- Load the vmlinux file including code into the debugger virtual memory with **`Data.LOAD.Elf vmlinux AVM:0 /NoSymbol`**
- Dump the **`linux_banner`** from loaded vmlinux: **`Data AVM:linux_banner /NoHex /NoOrient`**
- Compare both strings including timestamps

Notes

- In OpenEmbedded/BitBake environments, multiple kernel variants (`Image-5.10-minimal`, `Image-5.10-xen`, etc.) may be built in the same directory. The loaded `vmlinux` might not reflect the kernel binary on the target.

- Since Linux 5.9, the `0x80000` offset has been removed, but some bootloaders may still start the kernel at `0x80000`, causing relocations to the next aligned address.

Refer for more information to Training Linux Debugging.