



IPS Hands-On

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And

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Initial Setup

- Log on to Franklin
- Supported shell: `bash`
- Execute the shell command:
 - `/project/projectdirs/m876/swim.bashrc.franklin`
 - This should be done for all sessions involving IPS, and included in any batch scripts as well – or included in your `.bashrc.ext` file
- Copy the following IPS tar files to your **\$SCRATCH** work area
 - `/project/projectdirs/m876/IPS-binary.tar.gz`
 - `/project/projectdirs/m876/IPS-src.tar.gz`
- `IPS-binary.tar.gz` contains a pre-built IPS distribution.

Building the IPS

- Execute the following commands to build and install the IPS distribution

```
tar zxvf IPS-src.tar.gz
cd IPS
make
make install
```
- Alternatively, just untar the IPS-binary tar file

```
tar zxvf IPS-binary.tar.gz
```
- The framework code, component scripts, and auxiliary binaries are installed in **IPS/bin**



Desktop Elvis

- Download from <http://w3.pppl.gov/elvis/latest/index.html>
- Sometimes more reliable than plugin-version (especially for large files).



Task1: Hello World

- Components and configuration file are found in **IPS/components/drivers/hello**
- Edit the configuration file to use your own installation of the IPS distribution, and your own user name.
- Platform config file is in **IPS/franklin.conf**
- Run the example simulation:
`IPS/bin/ips -config=hello_world.config`
- Check the log files, and the SWIM monitoring portal at <https://cswim.org/monitor> for the finished simulation.
- Create a batch script (`create_batch_script.py`), edit it, and submit it through the batch system.



Create IPS Batch Script

```
python create_batch_script.py --ips=PATH_TO_IPS      \  
    [--config=CONFIG_FILE_NAME]+                    \  
    --platform=PLATFORM_FILE_NAME                   \  
    [--account=CHARGE_ACCOUNT]                      \  
    [--queue=BATCH_QUEUE]                           \  
    [--walltime=ALLOCATION_TIME]                     \  
    [--nproc=NPROCESSES]                            \  
    [--debug]                                        \  
    [--ftb]                                          \  
    [--output=BATCH_SCRIPT]
```



Hello World - cont.

- Create the Fortran program `hello_app.f90` (in `components/drivers/hello`) to print the hello world message. Edit the `Makefile` to add `hello_app` as an executable target.
- Execute `make; make install` to install `hello_app`
- Edit the `hello_worker.py` script to use the `launch_task()` framework service to launch `hello_app` instead of the Python print statement.
- Run the modified simulation (this will only work through the batch system).



Task 2: Sequential Model Simulation

- The IPS distribution contains a set of “*model*” physics components that do not involve invocation of real underlying applications.
- In this task we will run a model simulation, where components are invoked sequentially, and familiarize ourselves with the component code and output tree.
- The configuration file for the simulation can be found in `/project/projectdirs/m876/PROTO_FSP_CODING_CAMP` file name `seq_model_sim.config`

Task 2: Cont

- Edit the sequential configuration file to use your own IPS installation and user name.
- Adjust the paths (and URL) in the monitor component configuration section to point to your own web-visible area on Franklin.
- Create a batch script to run the sequential model and monitor its progress using the SWIM monitoring portal.
- Change the time loop section of the configuration file and re-run the simulation.



Task 2: Cont.

- Add the `hello_world` worker component to the components used in the sequential simulation:
 - Add a `PORTS` entry and a corresponding `IMPLEMENTATION` section to the config file.
 - Edit the driver code (the source can be found in the directory `IPS/components/drivers/dbb/`) to add code to get access to the `hello_world` worker component, and invoke its `step()` method. `make install` is needed afterwards.
 - Run the modified simulation.
- Run two instances of the sequential model simulation concurrently, making any necessary changes to the config files used (*hint: you **cannot** use the same config file twice*)



Task 3: Concurrent Model Simulation

- This model simulation showcases the concurrent execution of component methods and the way concurrent components share and update the shared plasma state data.
- The configuration file for this simulation can be found in `/project/projectdirs/m876/PROTO_FSP_CODING_CAMP` file name `conc_model_sim.config`

Task 3: Cont

- Edit the concurrent configuration file to use your own IPS installation and user name.
- Adjust the paths (and URL) in the monitor component configuration section to point to your own web-visible area on Franklin.
- Create a batch script to run the concurrent model and monitor its progress using the SWIM monitoring portal.



Task 3: cont.

- Edit the driver code (the source can be found in the directory **IPS/components/drivers/dbb/**) to change the concurrent execution to sequential execution. Rerun the simulation.