BAYNCORE

Profiling oneAPI Code Using the VTune™ Server

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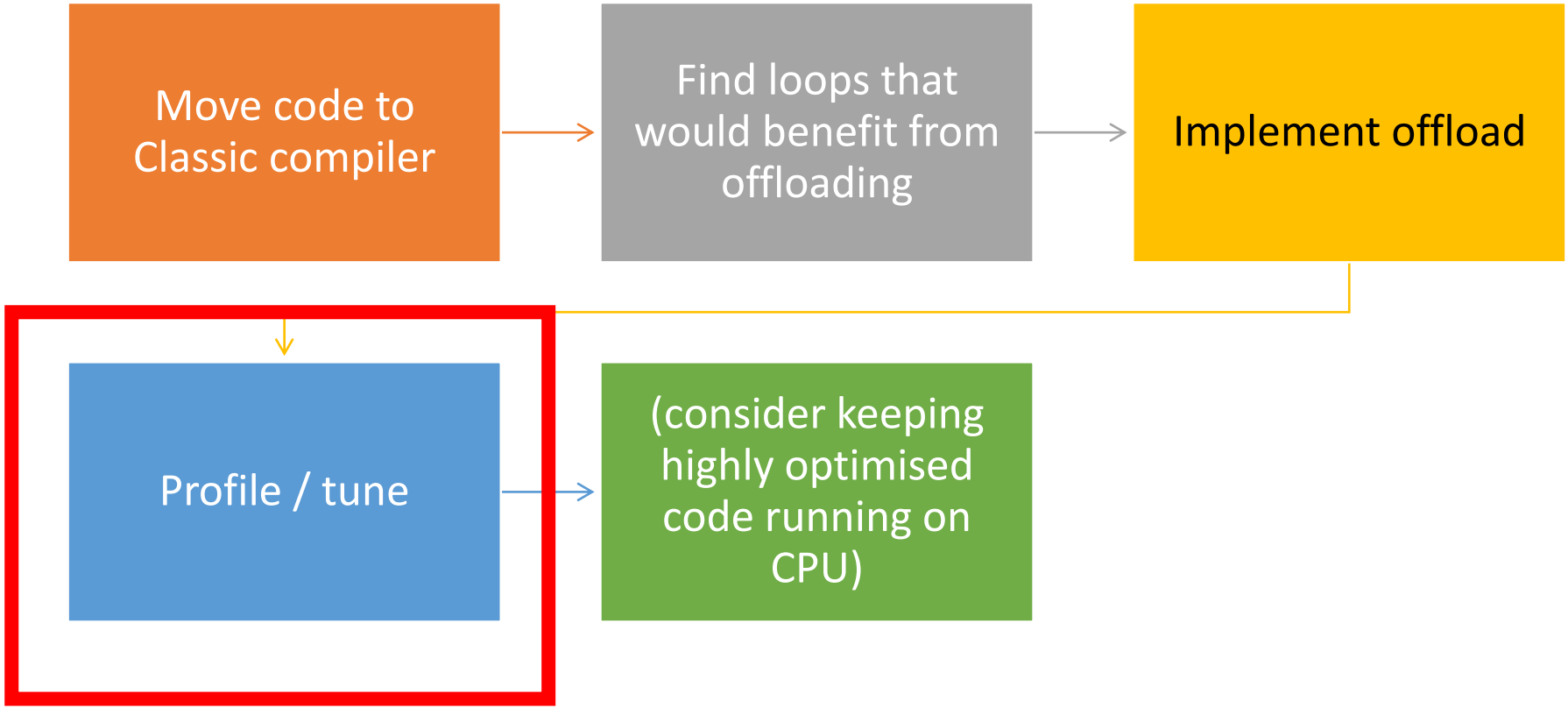
Four Step Strategy



VTune Self-Checker

`<install-dir>/bin64/vtune-self-checker.sh`

- **Hotspots**/Threading in the **user-mode** sampling
- **Hotspots** hardware **event-based** sampling with/without stacks
- **HPC Performance** Characterization
- **Microarchitecture** Exploration analysis
- **Memory Access** analysis with uncore events
- **Threading** with hardware **event-based** sampling
- **Performance** Snapshot
- **GPU** Compute/Media Hotspots

Running the Self-Checker

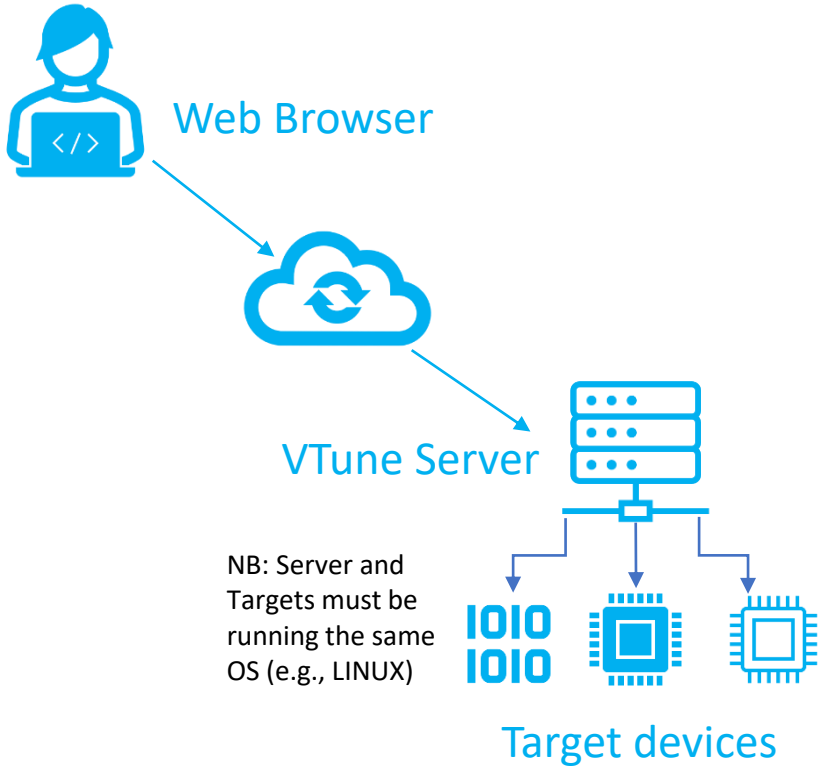
```
#source the tools
source /opt/intel/oneapi/setvars.sh

#set profiling permissions
echo 0 | sudo tee /proc/sys/dev/i915/perf_stream_paranoid
echo 0 | sudo tee /proc/sys/kernel/kptr_restrict
echo 0 | sudo tee /proc/sys/kernel/yama/ptrace_scope
echo 0 | sudo tee /proc/sys/kernel/perf_event_paranoid

# call the self checker
vtune-self-checker.sh
```

VTune Profiler Server

- Light weight server.
- View from web browser
- Personal use
  - Already installed with HPC toolkit
  - Available on DevCloud
- Full-scale corporate deployment
  - Multi-User
  - Supports SAML SSO
  - Supports reverse proxy and transport security



https://www.intel.com/content/www/us/en/develop/documentation/vtune-help/top/installation/install-web-server.html

1-Client 1-Host setup

From laptop

Replace with your compute node name

```
ssh stephen@192.168.0.66
source /opt/intel/oneapi/setvars.sh
vtune-backend --web-port=55001 --enable-server-profiling
# it returns a url to open in browser on laptop – do after next step
```

From laptop in a new command prompt :

```
ssh -L 127.0.0.1:55001:127.0.0.1:55001 stephen@192.168.0.66
```

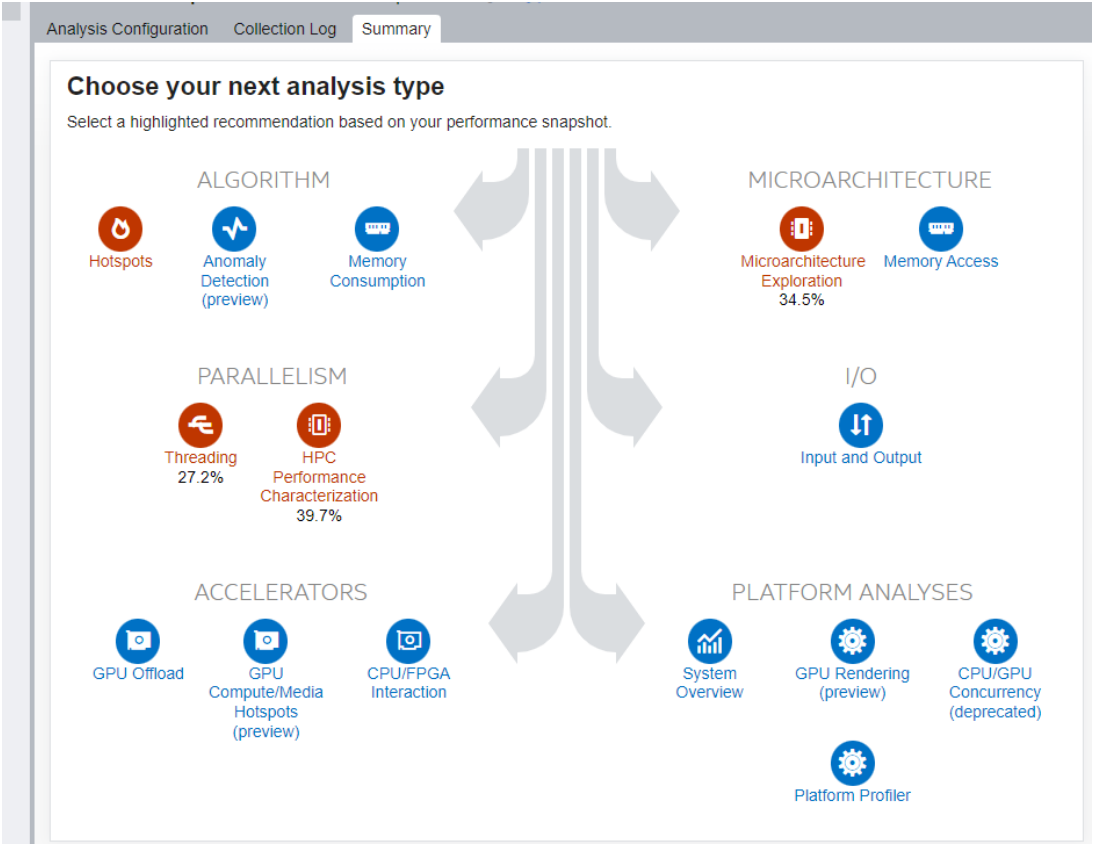
DevCloud setup

- ssh devcloud
- qsub –I
- ssh -L 127.0.0.1:55001:127.0.0.1:55001 devcloud
- ssh -L 127.0.0.1:55001:127.0.0.1:55001 s000-n000
- vtune-backend --web-port=55001 --enable-server-profiling

Replace with your compute node name

Next Steps…

After running a performance snapshot, VTune recommends the next type of analysis to do.



Run and collect VTune™ data

```
vtune -collect gpu_hotspots -result-dir vtune_data a.out
```

Various types of profiling data can be collected like `hotspots`, `memory-consumption`, `memory-access`, `threading` ...

Use the command line help to find out more:

```
vtune --help -collect
```

Generate html report for collected VTune™ data:

```
vtune -report summary -result-dir vtune_data -format html -report-output $(pwd)/summary.html
```

Various types of report can be generated like `summary`, `top-down`, `callstacks` ...