

MICHIGAN STATE
UNIVERSITY

Beta Presentation

SmartSat™ Heterogenous Computing in Space

The Capstone Experience

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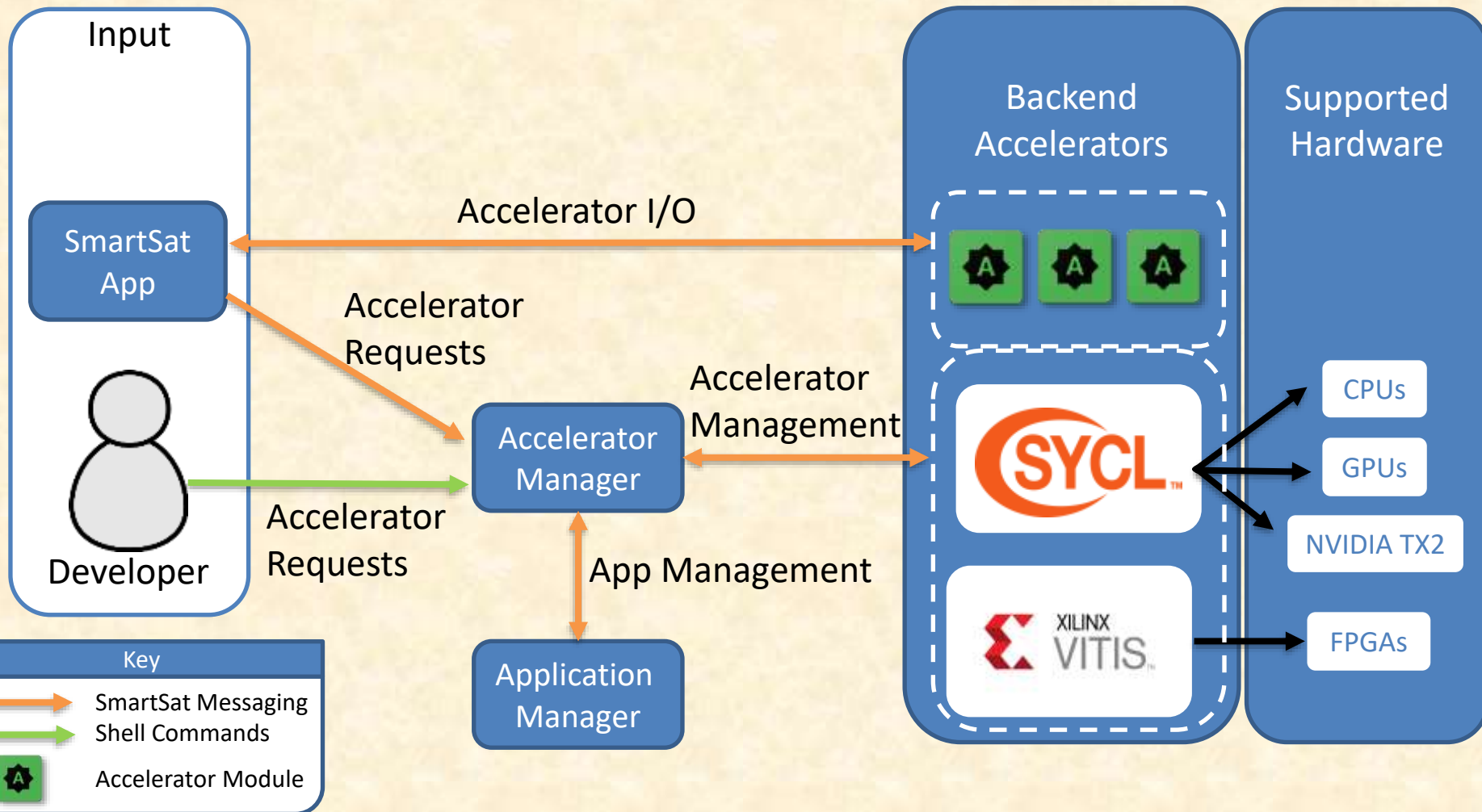
*From Students...
...to Professionals*

Project Overview

- Manage and load accelerator programs
- Optimize hardware usage with smart selection
- Reduce downlink time through on board data processing



System Architecture



Startup Backend Applications



The image displays two terminal windows. The top window shows the command `run_appmanager` being executed in a terminal window titled `alex@alex-laptop-ub: ~/Desktop/smartsat-app-sdk-ubuntu-bionic`. The bottom window shows the command `run_app -r` being executed in a terminal window titled `alex@alex-laptop-ub: ~/Desktop/smartsat-app-sdk-ubuntu-bionic`.

```
alex@alex-laptop-ub:~/Desktop/smartsat-app-sdk-ubuntu-bionic_681_514/AppManager$ run_appmanager
```

```
alex@alex-laptop-ub:~/Desktop/smartsat-app-sdk-ubuntu-bionic_681_514/AcceleratorManager$ run_app -r
```



Accelerator Load Command

```
Message to Accelerator Manager:  
Command LOAD  
BackendCommands:  
  1. SYCL  
    Command: LOAD  
    Accelerator Name: CPUSycl  
    Accelerator Name: GPUSycl  
  
Waiting to send LOAD command
```



Accelerator Unload Command

```
Message to Accelerator Manager:  
Command UNLOAD  
BackendCommands:  
  1. SYCL  
    Command: UNLOAD  
    Accelerator Name: GPUSycl  
  
Waiting to send UNLOAD command
```



Accelerator Output Greyscale Image



What's left to do?

- Deploy SYCL Smart-Sat platform to TX2
- Complete Vitis Backend integration
- Test deployment on complete system; a machine with access to TX2 and FPGA



Questions?

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