LOW-EFFORT GNURADIO-REDHAWK INTEGRATION

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SPECIAL THANKS

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OVERVIEW OF TOPICS
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• What is REDHAWK?
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• What is REDHAWK?
• Why integrate with REDHAWK?
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• What is REDHAWK?
• Why integrate with REDHAWK?
• Integration Concept

GNU Radio + REDHAWK
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• Docker-Aware GPP

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- What is REDHAWK?
- Why integrate with REDHAWK?
- Integration Concept
- Flow Graph Converter
- Docker-Aware GPP
- Parting Thoughts
WHAT IS REDHAWK?
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• Not GNURadio’s Enemy :-)
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- Fundamentally: Distributed Computing
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  • Device? Hmm…  
• Don’t like CentOS? Need embedded?
WHY INTEGRATE WITH REDHAWK?
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• RF front end agnostic using FrontEnd Interfaces spec.
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• Infrastructure as a Service (IaaS)
WHY INTEGRATE WITH REDHAWK?

• RF front end agnostic using FrontEnd Interfaces spec.
• Infrastructure as a Service (IaaS)
• Integration with ISR infrastructure (e.g., TOA)
INTEGRATION CONCEPT

Wrapping a Flow Graph with a Component
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- Component manages run state
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- Properties update variables
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• Component process loop does…
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• Component process loop does…

Nothing.
FLOW GRAPH CONVERTER

Lowering the Bar
FLOW GRAPH CONVERTER

- Converts GRC to REDHAWK XML
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- Searches for variables and blocks
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- Uses REDHAWK Code Generation
- Also generates Docker-aware versions
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- Converts GRC to REDHAWK XML
- Searches for variables and blocks
- Resulting lists become project files
- Uses REDHAWK Code Generation
- Also generates Docker-aware versions
- Supports simple properties and BULKIO at this time
DOCKER-AWARE GPP
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- Standard GPP + Docker Control
DOCKER-AWARE GPP

- Standard GPP + Docker Control
- Component’s dependencies installed in a Docker Container
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- Component’s dependencies installed in a Docker Container
- Docker-GPP can launch the Container from a standard REDHAWK installation
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- Standard GPP + Docker Control
- Component's dependencies installed in a Docker Container
- Docker-GPP can launch the Container from a standard REDHAWK installation
- GNURadio-REDHAWK Runtime image is based on Ubuntu 16.04
PARTING THOUGHTS...
IS DOCKER-GPP REQUIRED?
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No.
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No.

However, this means installing the superset of dependencies at every REDHAWK GPP*
PERFORMANCE?
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Source and Sink blocks are Python
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Tested at a little over 1 Msp Complex Floats without overflowing
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Source and Sink blocks are Python
Tested at a little over 1 Msps Complex Floats without overflowing
Translating to C would likely help
MORE DETAILS
EXAMPLE
DEMO:

geontech.com/gnuradio-redhawk-integration