

Week 2 Status: Confluence Verification

Date: January 31, 2026

Status: ⚠️ IN PROGRESS

Branch: devsite

Current State

✅ What's Working

Python Pipeline:

- ✅ `spec_to_ir.py` generates proper semantic IR
- ✅ `ir_to_code.py` generates code successfully
- ✅ End-to-end pipeline works: Spec → IR → Code
- ✅ Tested with `ardupilot_test` specs
- ✅ Output: Valid Python code with function stubs

Rust Pipeline:

- ✅ `stunir_spec_to_ir` generates proper semantic IR
- ⚠️ `stunir_ir_to_code` requires `--target` parameter (not auto-detected)

SPARK Pipeline:

- ⚠️ `stunir_spec_to_ir_main` fails silently (no output, no error)
 - ❌ Cannot test `ir_to_code` without IR
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Issues Found



Issue #1: SPARK `spec_to_ir` Fails Silently

Command:

```
./tools/spark/bin/stunir_spec_to_ir_main --spec-root spec/ardupilot_test --out /tmp/test.json
```

Result: No output, no error, no IR file created

Impact: Cannot test SPARK pipeline



Issue #2: Rust `ir_to_code` Requires Target Parameter

Command:

```
./tools/rust/target/release/stunir_ir_to_code ir.json -o output.txt
```

Error:

```
error: the following required arguments were not provided:
  --target <TARGET>

Usage: stunir_ir_to_code --target <TARGET> --output <OUTPUT> <IR_FILE>
```

Impact: Cannot auto-test Rust pipeline without knowing target



Issue #3: Python ir_to_code Requires Multiple Parameters

Command:

```
python3 tools/ir_to_code.py ir.json output.txt
```

Error:

```
usage: ir_to_code.py [-h] --ir IR --lang LANG --templates TEMPLATES --out OUT
```

Correct Usage:

```
python3 tools/ir_to_code.py --ir ir.json --lang python --templates templates/python --out output_dir
```

Impact: Confluence test script needs updating

Manual Testing Results

Python Pipeline

```
# Step 1: Spec → IR
python3 tools/spec_to_ir.py --spec-root spec/ardupilot_test --out /tmp/test.json
# Result: SUCCESS - Generated semantic IR with 11 functions

# Step 2: IR → Code
python3 tools/ir_to_code.py --ir /tmp/test.json --lang python --templates templates/python --out /tmp/output
# Result: SUCCESS - Generated mavlink_handler.py
```

Output Sample:

```
def parse_heartbeat(buffer, len):
    """parse_heartbeat"""
    # TODO: implement
    raise NotImplementedError()
```

Next Steps

Immediate (Today)

1. **Fix SPARK spec_to_ir** - Debug why it fails silently
2. **Update confluence test script** - Use correct command-line arguments
3. **Add target detection** - Auto-detect target from IR or spec

Short-term (This Week)

1. **Complete confluence testing** - Test all 3 working pipelines
 2. **Document API differences** - Create unified interface spec
 3. **Generate confluence report** - Show which pipelines match
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Confluence Test Script Status

Current: ✗ Failing - Incorrect command-line arguments

Fixed: ⚠ Needs update for:

- Python: `--ir`, `--lang`, `--templates`, `--out`
 - Rust: `--target`, `--output`
 - SPARK: Debug silent failure
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Week 2 Progress

- ☒ [x] Create confluence test infrastructure
- ☒ [x] Test Python pipeline manually
- ☒ [x] Identify SPARK issues
- ☒ [x] Identify Rust issues
- ☐ [] Fix SPARK spec_to_ir
- ☐ [] Update confluence test script
- ☐ [] Run full confluence tests
- ☐ [] Generate confluence report
- ☐ [] Commit to devsite

Estimated Completion: End of Week 2 (pending SPARK fix)