

GenA: XML to ADA Code Generation

SDMAY21-45 Team Information

Client: Collins Aerospace
Client Contact: David Lempia
Faculty Advisor: Dr. Andrew Miner

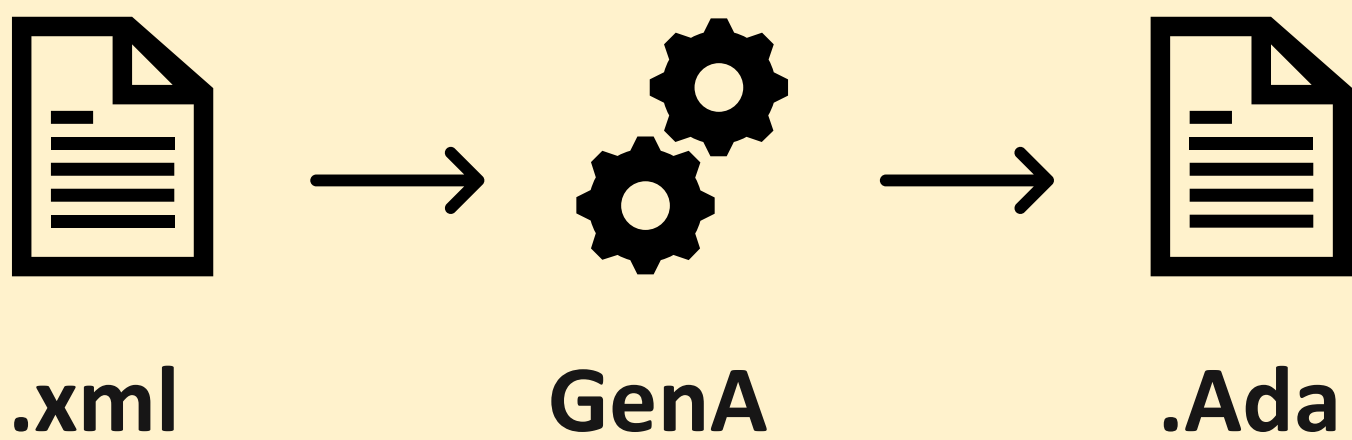
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Problem Statement

Collins Aerospace uses Network Data Objects (NDOs) defined in Ada to communicate between avionics systems. Before Collins' engineers write these messages in Ada, they are strictly defined in an XML file. The engineer will then write the message in Ada using the XML file. This process is tedious and error prone.

Proposed Solution:

This project aims to create a code generation tool that will directly translate the XML file into Ada code. This will reduce errors in manual translation and improve developer efficiency.



Requirements

Functional Requirements:

- GenA shall generate Ada from XML
- Ada code shall be in compliance with Ada 95 Standards
- Generated Ada code shall include basic functionality
- GenA shall be extendable as the needs of Collins change

Non-Functional Requirements:

- GenA should be maintainable
- GenA should have the capability to generate code in languages other than Ada

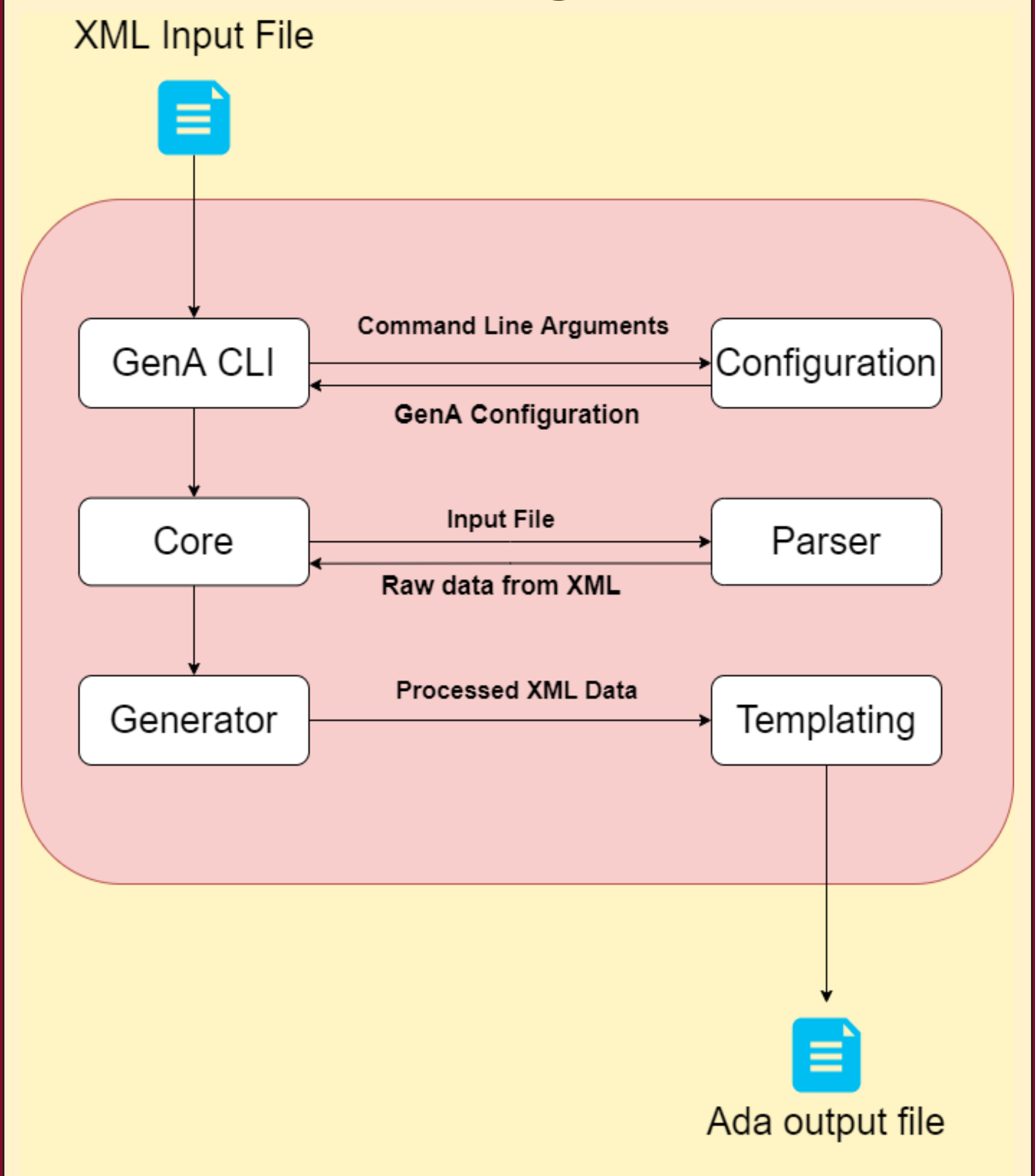
Operating Environment:

GenA shall operate from the command line as a packaged JAR file.

Intended Users

The intended users are engineers at Collins Aerospace

Design



Technical Details

CLI Module: Processes command line arguments. *Java, Commons-CLI*

Config Module: Converts Command line args into a generation configuration. *Java*

Core Module: Handles orchestration between modules. *Java*

Parser Module: Parses raw XML data into Java objects. *Jackson, Java*

Generator Module: Computes necessary information for generation from raw data. *Java*

Templating Module: Writes computed data into Ada code template. *Handlebars*

Testing

- User Acceptance testing
- Integration Testing
- Unit Testing

Resources

- Client Input
- Documentation from Client

Standards

- Ada 95 Standard
- Google Java Style Guide
- XML 1.0 (W3C)
- Collins Ada Standard