



ANTLR Parser Modernization for EXPRESS

Helping the European Space Agency modernize an EXPRESS parser and express2lightcpp for the STEP-TAS environment.

AT A GLANCE

CLIENT

European Space Agency

INDUSTRY

Space / Research /
Engineering

LEGACY TECHNOLOGY

ANTLR 2 parser

MODERN PLATFORM

ANTLR 4

About ESA

The European Space Agency (ESA) is Europe's gateway to space. It is dedicated to the peaceful exploration and use of space for the benefit of humanity.

Established in 1975, the Agency works with 23 member states to push the frontiers of science and technology, and promote economic growth in Europe.

1975

Agency established

23

Member states

STEP

Parser work for the STEP-TAS environment

A4

ANTLR 4 modernization target

THE CHALLENGE

Modernizing an outdated EXPRESS parser

The thermal analysis and verification section in ESA needed to modernize their EXPRESS parser and `express2lightcpp`. The parser is used to process a series of definitions written in a subset of the EXPRESS language, to ultimately drive the generation of code for an application library which is part of the STEP-TAS environment for thermal model exchange.

The original parser was based on ANTLR 2, from which support was withdrawn in the mid-2000s. It was difficult to use and integrate with other systems.

**ANTLR
2**

Unsupported legacy parser foundation

"Strumenta has experts who have specific experience doing this type of conversion. I wouldn't have been able to do this in the time Strumenta did – probably not even in 3 times the time!"

Duncan Gibson

Software and Space Thermal Engineering support, ESA TEC-MTV

Why Strumenta?

The ESA chose Strumenta to modernize their parser because of Strumenta's software language engineering expertise, particularly in ANTLR.

There are also other key reasons Strumenta was chosen.

Guaranteed price

No hidden extras during the engagement.

90-day warranty

Any parser issue identified during the warranty period would be corrected at no extra cost.

Specific modernization experience

Strumenta had direct experience with this kind of parser conversion.

ANTLR expertise

The engagement was grounded in deep language engineering specialization.

Rebuilding the Parser on ANTLR 4

Strumenta developed a new grammar in ANTLR 4 for EXPRESS, the formal data modelling language defined by ISO 10303-11.

The modernization ensured that the new code generated by `express2lightcpp` remained compatible with the code currently produced.

A Maintainable Modern Parser

The new ANTLR 4-based solution gave ESA a more sustainable parser foundation while preserving compatibility with existing generated code.

Applications are more maintainable and easier to evolve.

ANTLR 4 platform support is available, unlike the retired ANTLR 2 base.

It is now easier to find developers because ANTLR 4 has a large expert community.

ANTLR

PARSER MODERNIZATION

EXPRESS

ISO 10303-11

STEP-TAS

“We had a positive experience and were very satisfied with everything. From the beginning, the communication and organization was clear. We were very happy with the work and the deliverables. We will definitely work with them again, should the opportunity arise.”

James Etchells

Head of Thermal Analysis and Verification, ESA TEC-MTV

Find out how Strumenta can help you.

Please contact us for any further information or visit our website.

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