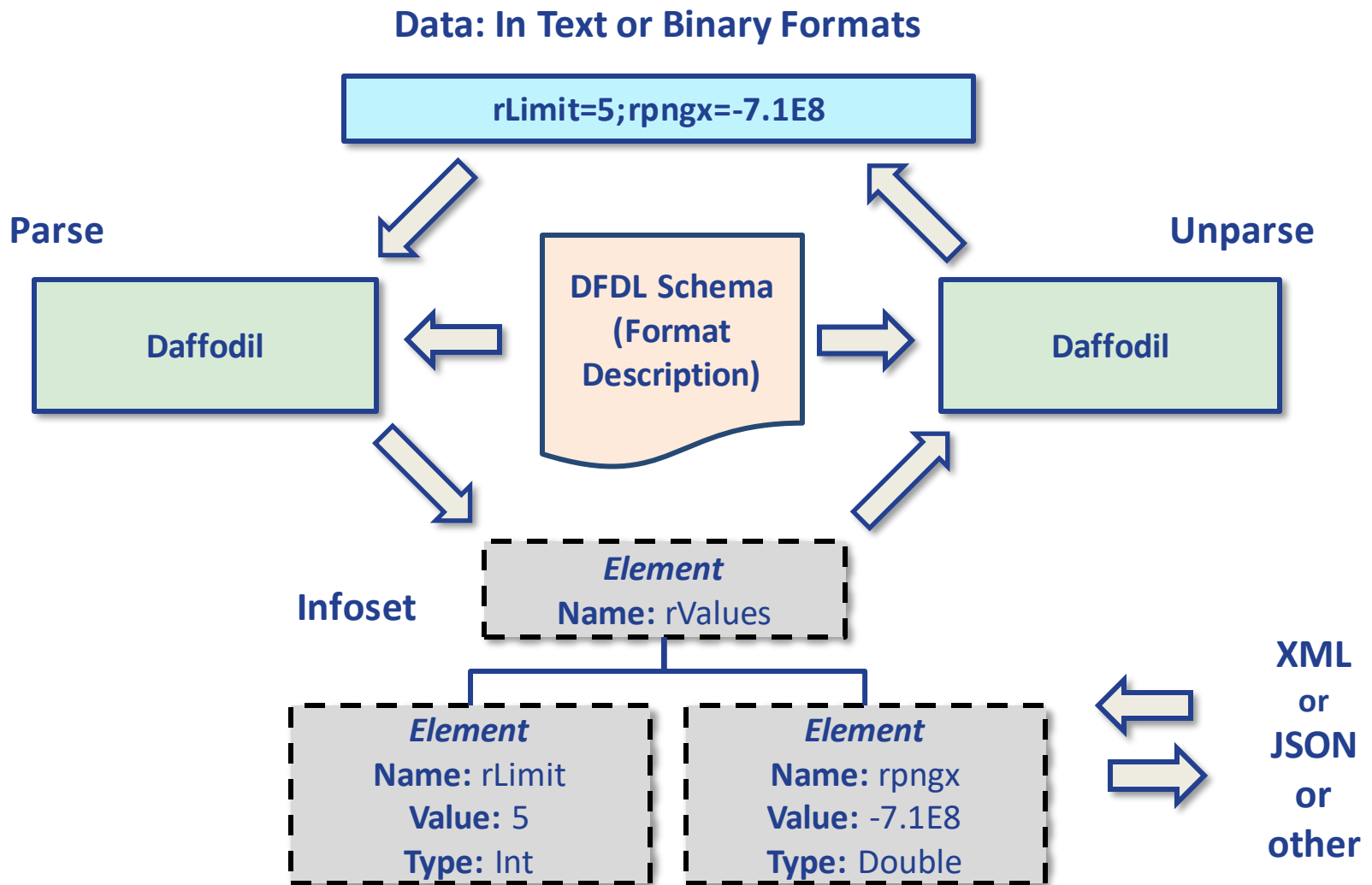*I just want to kill the data format problem once and for all*

APACHE
Daffodil™

Mike Beckerle, Data Archeologist, Tresys Technology
mbeckerle at tresys.com or at apache.org

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Deep.

Kill the Data Format Problem

Data: In Text or Binary Formats

rLimit=5;rpngx=-7.1E8

Parse

Unparse

Daffodil

DFDL Schema (Format Description)

Daffodil

Infoset

Element
Name: rValues

Element
Name: rLimit
Value: 5
Type: Int

Element
Name: rpngx
Value: -7.1E8
Type: Double

XML or JSON or other

Daffodil - Kill the Data Format Problem

- Podling since Sept 2017
- 4 Apache Releases - most recent July 2019
- Technology Status
  - Being deployed in military cybersecurity systems today
  - More than 40 data format schemas available. Breadth of formats covering:
    - FINSERV - Card Transactions ISO8583, NACHA, Point-of-Sale TLOG
    - Supply-Chain - EDIFACT
    - Health Care - HL7
    - Military messaging - Link16, VMF, USMTF
  - Preliminary Integrations with NiFi, Spark

- Status: Community Building ☹
  - The bad news: Existing PPMC all work for Tresys
- What have we been doing about it?
  - Presented
    - ApacheCon NA 2018, 2019, Apache DC Roadshow
    - Multiple meetups and non-Apache events (Cross-Domain Tech. Forum)
  - Ready for new developers
    - 32 "Beginner" JIRA Tickets

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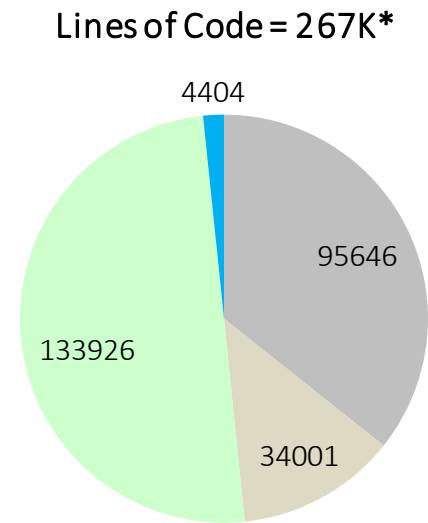**TRESYS Deep.**

Proposal to Sharks

We are requesting

- 10 hours of devoted shark time to
  - Identify new developers
  - Spread the word about Daffodil to data-framework/data-centric Apache projects
- In exchange for a pledge of
  - Up to 40 total hours of virtual pair-programming hands-on training for new developers
  - Assistance to anyone in DFDL schema development for their data format
  - Eternal gratitude

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Challenges in Recruiting Developers

Lines of Code = 267K*

- **Daffodil is big and complex**
  - Full-blown compiler for DFDL schemas
  - Efficient low-level runtime for parse/unparse
  - Learning curve is steep
- **Know or Learn Scala**
- **Know or Learn XML Schema**

- **We need developers ....**
  - undaunted by these challenges
  - motivated by the desire to *kill the data format problem once and for all.*

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Cool Daffodil Ideas...

- Add support for pointer-based formats like TIFF and ZIP.
- Extend Daffodil with SAX-style event streaming
- Hybrid Infoset
  - Daffodil directly constructs your framework-native data representation with tight metadata coupling
    - E.g., Spark Struct objects
  - Removes the XML/JSON conversion overheads
- Ultra-fast small-footprint backend for Daffodil
  - Generate C/C++
  - Generate FPGA for wire-speed parse/unparse
- Data-Format Debugger
  - Graphical display shows data and parsed tree and schema interactively

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