A Domain Specific Language for defining Nuclear Physics Experiments.

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Abstract:
  Tcl's support for the implementation of domain specific
languages (DSLs) has been used to define a language for describing the
readout and initial unpacking of data from nuclear physics experiments.
The DSL described has been tailored to the Weiner VM-USB USB/VME
interface module, and the NSCLSpecTcl data analysis software.
I will describe the extensions to TCL and a case study where this system
was deployed at Sateilyturvakeskus, the Radiation and Nuclear Safety
Authority of Finland.

Summary:
  I have designed and implemented a domain specific language that can
describe a nuclear physics experiment to software that manages
a Wiener VM-USB USB/VME controller. The same DSL can be interpreted by
a first stage event processor in NSCLSpecTcl to unpack the data acquired
by the VM-USB into parameters for analysis in further event processor
stages, or by SpecTcl's histogramming kernels. The software supports
many popular nuclear physics digitizer modules in a consistent way.
   This paper will describe the project at STUK in which this language
was deployed. The extensions to Tcl that implement the domain specific
language will be described.   The implementation will be described
for the Readout and for the NSCLSpecTcl software.
   Finally the experience of installing a data taking system based on
this DSL at the STUK Security Technology Unit for use with the PANDA
research project will be described.