Building a vendor-neutral network processing design solution: a status report

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Overview

What is the Network Processing Project?

- A multi-organization initiative to develop a high-level network processing design environment for exploring and evaluating network processing-based component and product designs

What does it do?

- Provides standardized, vendor-independent high level models of all critical elements for network processing—based designs.
- Supports academic research on network processing issues
- Supports development of high-level product models

Objectives

- Create a standardized environment for high-level design of network processing-powered products
- Reduce design & development cost of network processing-based products
- Develop mechanisms for applying task and application benchmark data to design problems
- Support the development of executable standards Encourage academic research into network processing related hardware and software issues
- Develop a cadre of new engineers training in network processing-related design issues

The Problem

- Today's network-processing based switches require extensive NP vendor support.
- Task-level benchmarks for network processing components are meaningless unless they can be evaluated in the context of a system that incorporates other components.
- The high cost of vendor-specific development platforms makes it difficult today for switch vendors to actively consider multiple solutions.
- Common interface specifications are a necessary condition for achieving the "best of breed" promise of network processing, but by themselves they are not enough.

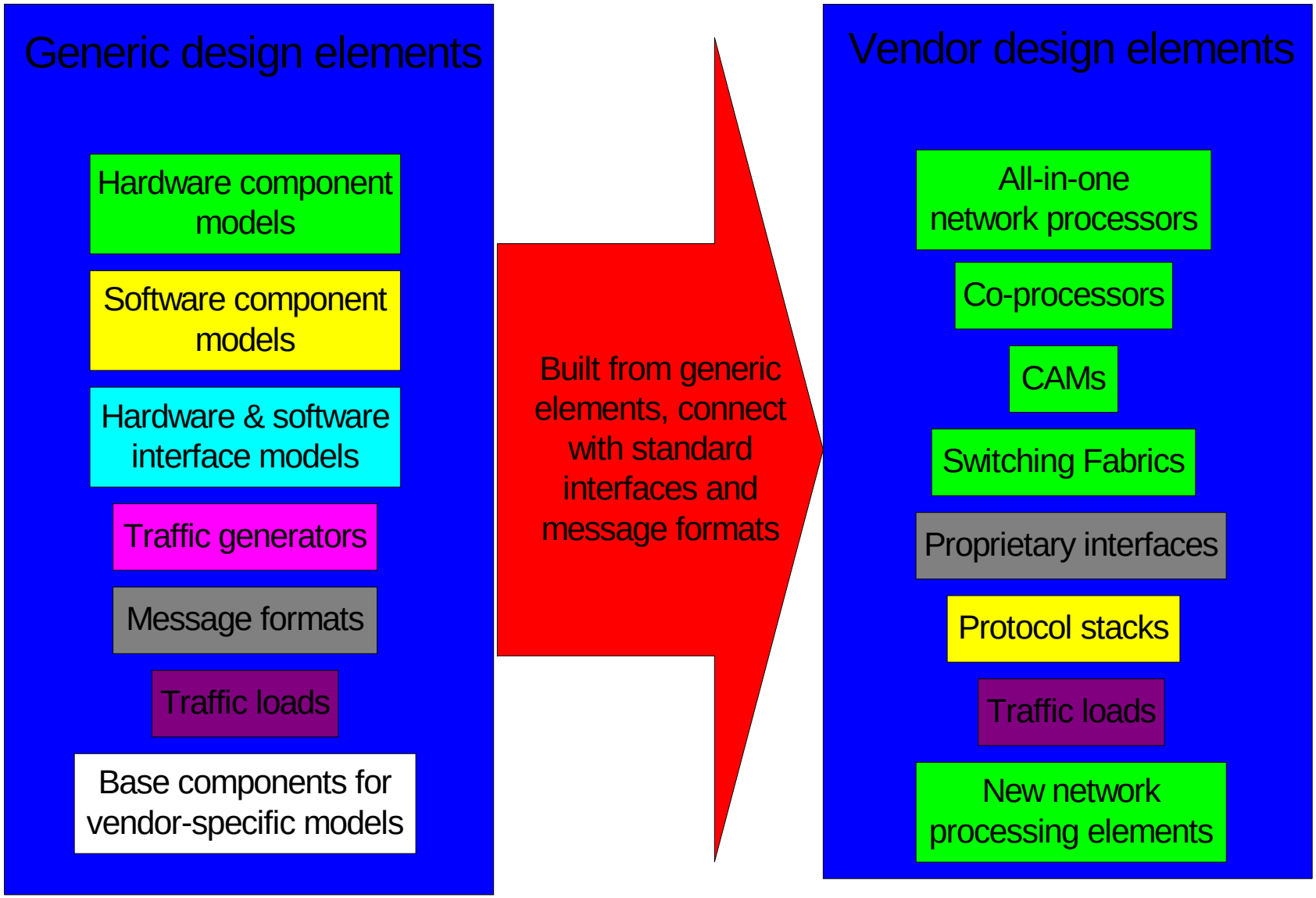
Current Solutions

- Device-specific models
  - Cycle-accurate hardware device models
  - More abstract behavior/performance models
- Programming tools
  - Software design tools
  - Software simulation tools
- System-level design tools
  - Environments
  - Languages
  - Platforms

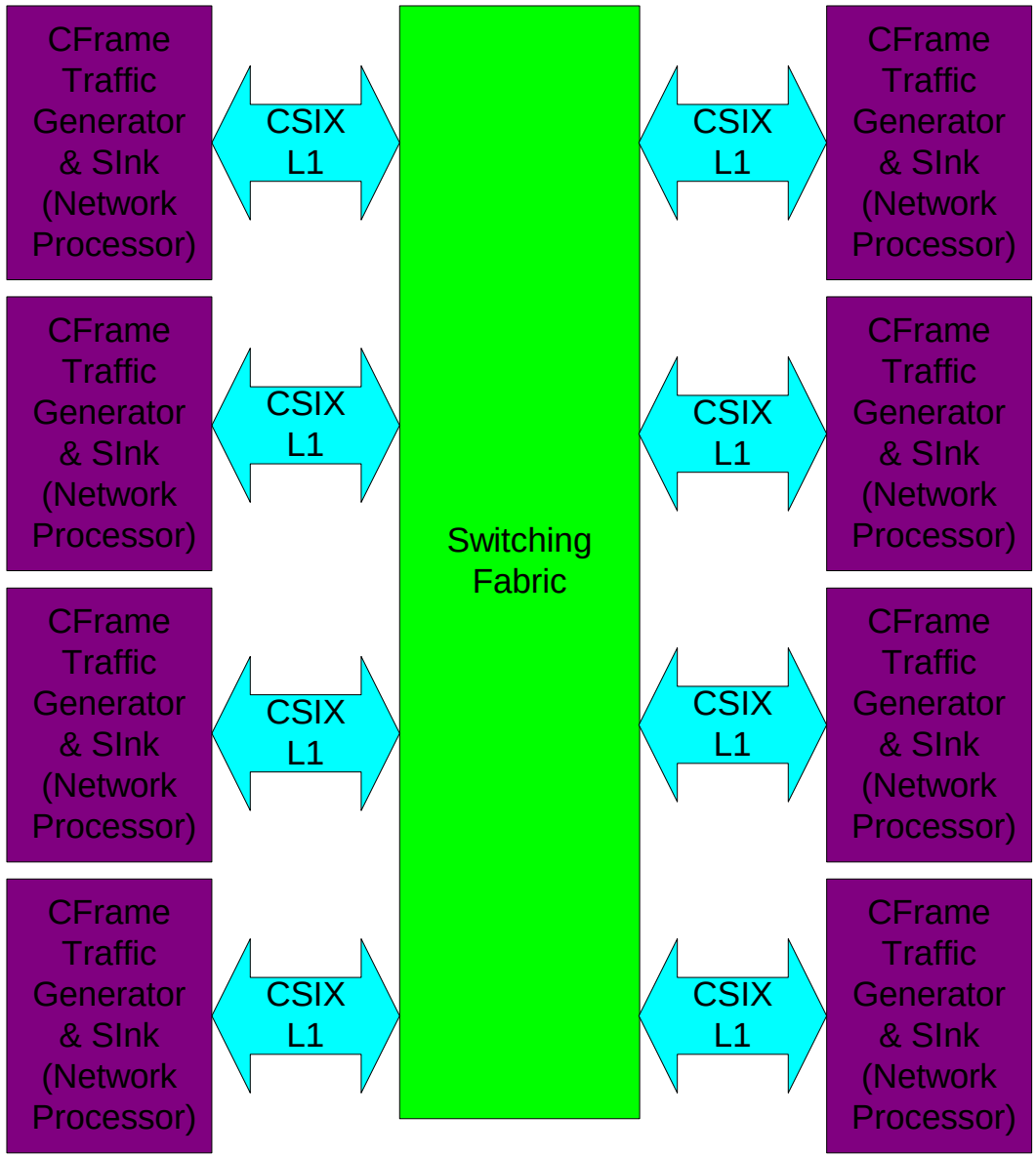
NP Project Components

- Standardized hardware interfaces--Network Processing Forum
- Standardized software interfaces--Network Processing Forum
- Standardized application benchmarks (e.g., IPv4 stream processing)--Network Processing Forum
- Standardized task benchmarks (eg switching fabric)—Network Processing Forum
- Network Processing reference platform model—MLDesign Technologies
- Analytic & product-specific model development—multiple academic & commercial entities

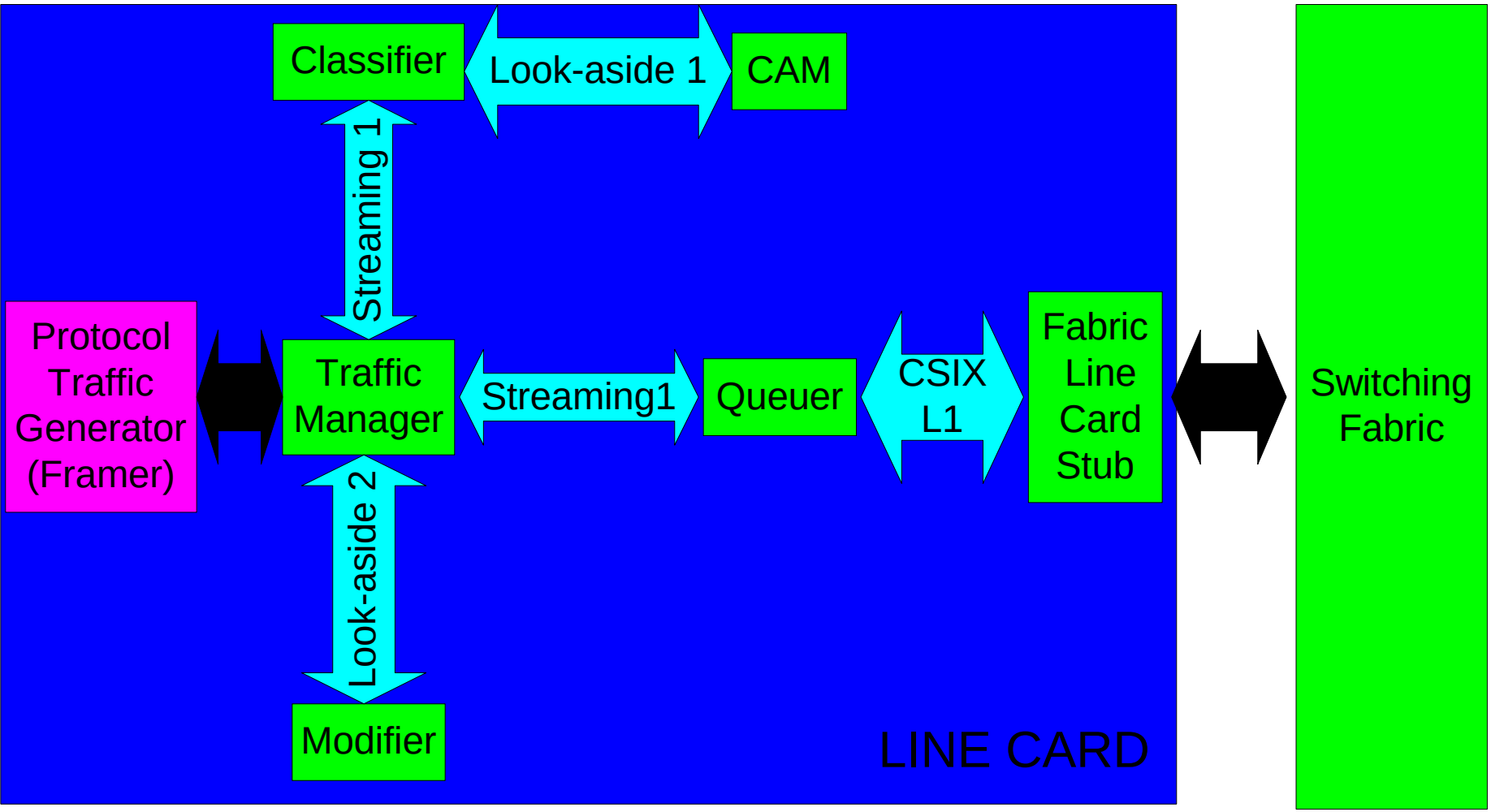
Design elements



Simple example: Fabric benchmark



Reference platform composite example



Join the project

- Support academic programs . . .
- Evaluate the design environment
- Develop vendor models
- For more information contact…
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