

Secure-by-Construction Composable Componentry for Network Processing

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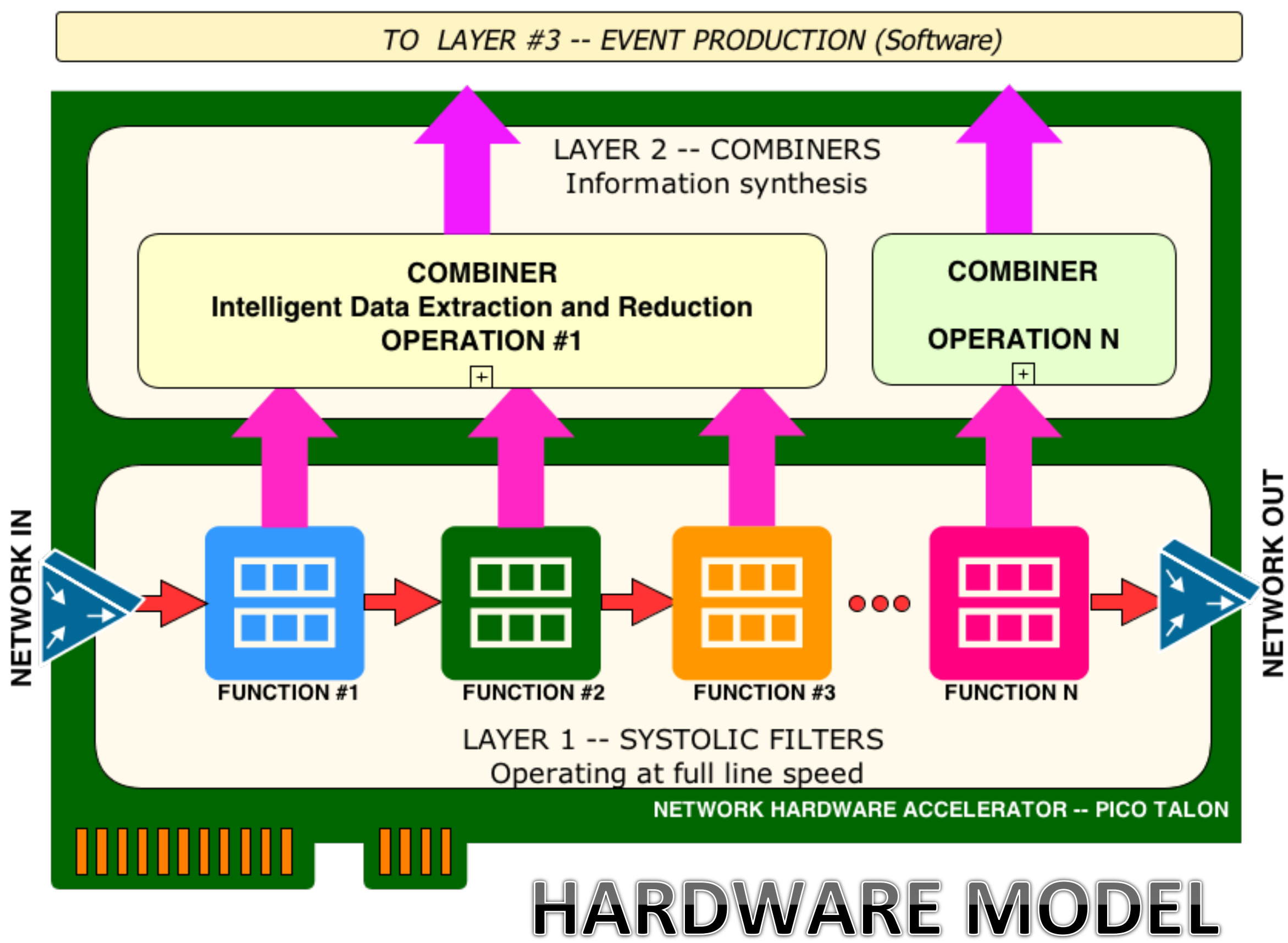
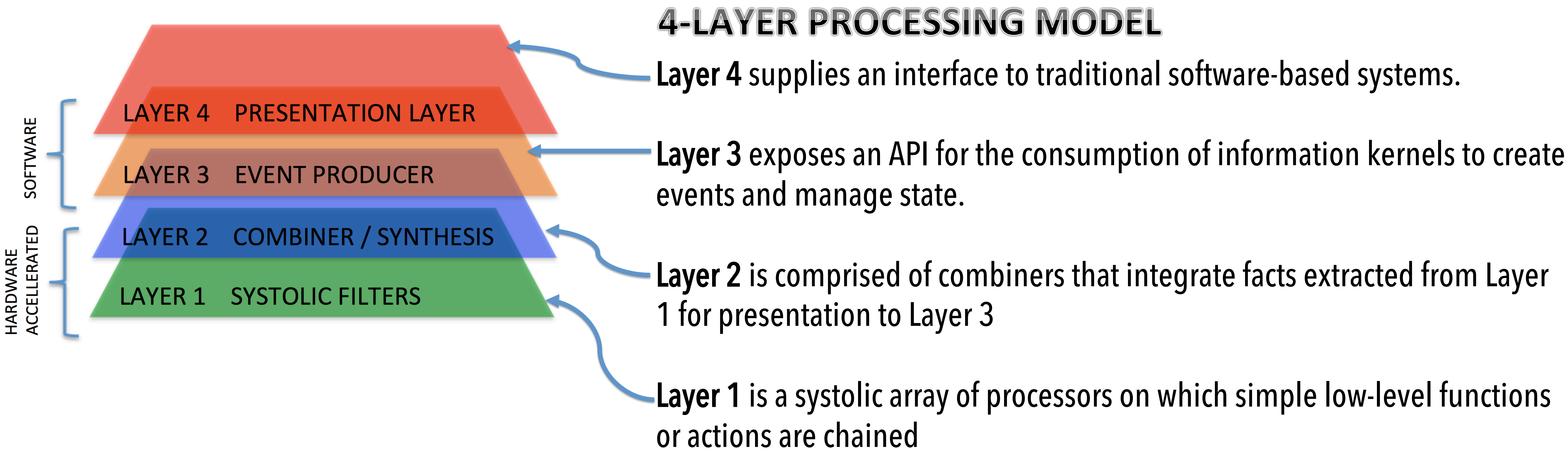
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Nicholas Macias

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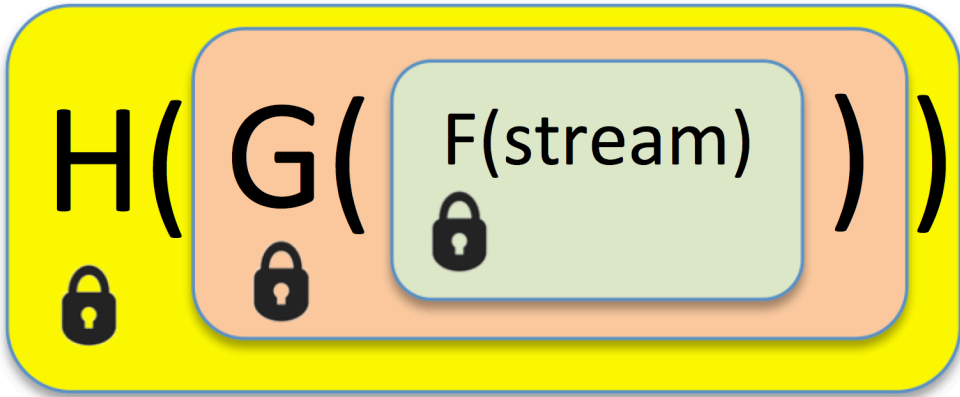
PROBLEM STATEMENT

- There is a lack of hardware/software systems providing stream processing and data stream analysis operating at the target data rates
- There is a distinct advantage to utilizing high-bandwidth or line-speed analytics to reduce time-to-discovery of information
- There is a need for agile deployment in response to changing objectives
- There is an opportunity to constrain designs to use only secure components to achieve their specific objectives.

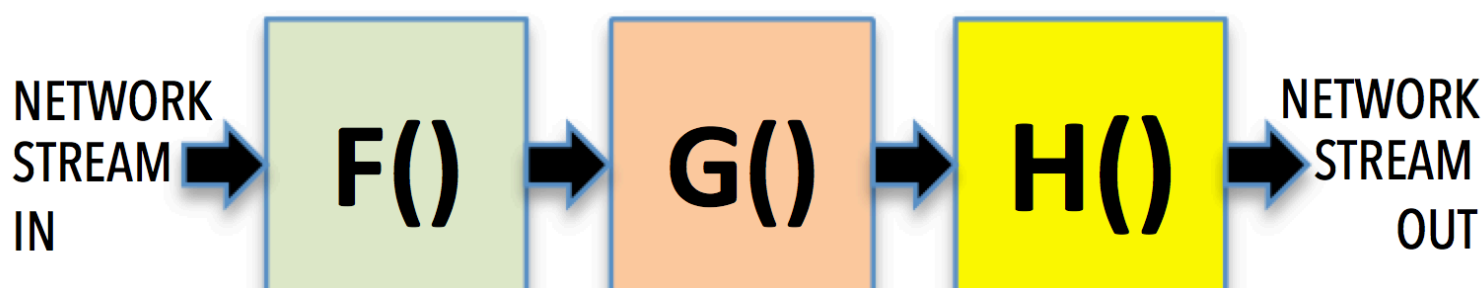


COMPOSABLE HARDWARE NETWORK FILTERS

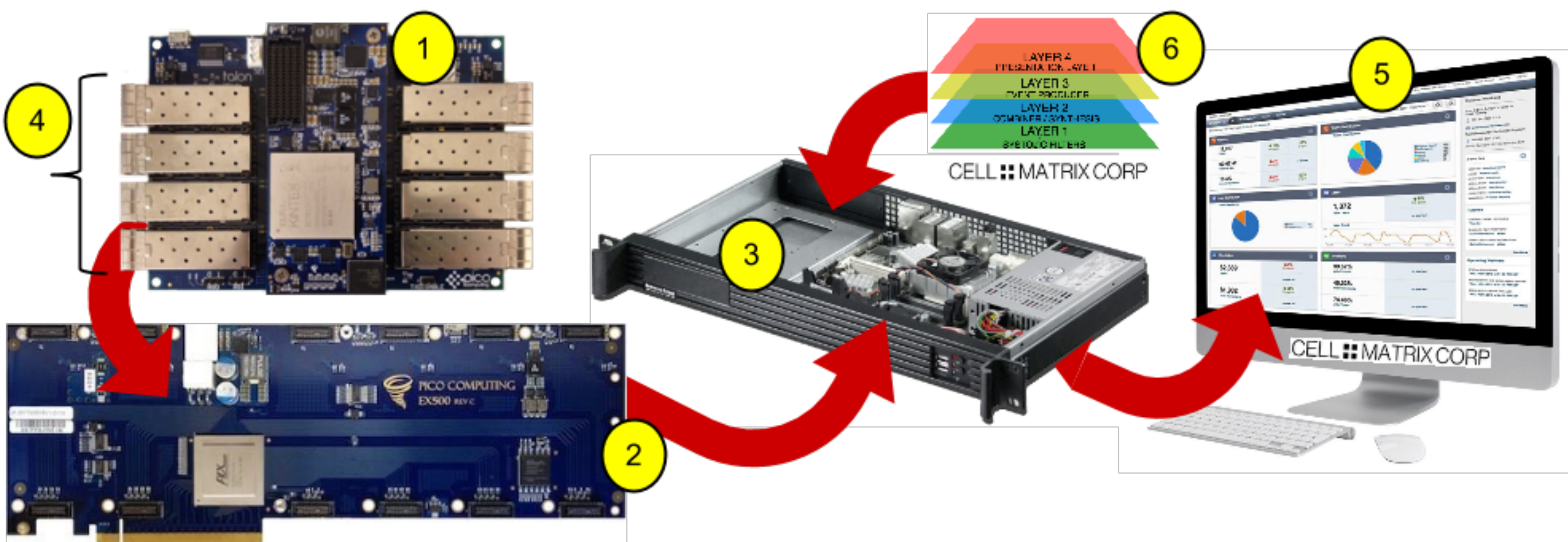
- Low-level network filtering primitives are constructed individually using secure hardware design practices (bound check, range check, etc):
 - Occurrence filters
 - NAT filters
 - Scatter-gather filters



- Higher-level secure network operations are created through the composition of individual components.



- Modular processing chains are rapidly assembled within FPGA fabric, as needed for specific operations.



The Cell Matrix Stream Processor, consisting of (1) Pico Computing 8x 10GigE Talon platform, capable of 40 Gbps provides stream-rate packet filtering, (2) Talon PCI carrier, (3) commodity 1U server blade, (4) 10Gb network ports, and (5) output analytics, all governed by (6) the Cell Matrix 4-Layer Stack.