

SDN Interactive Manager: An OpenFlow-Based SDN Manager

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1. Motivation & Objectives
2. Prototype Implementation
3. Controller Modifications
4. Prototype GUI

Monitoring, Visualization, and Configuration can be considerably different from traditional networks

- *E.g.*, SDN controller behavior impacts on resource consumption and forwarding performance

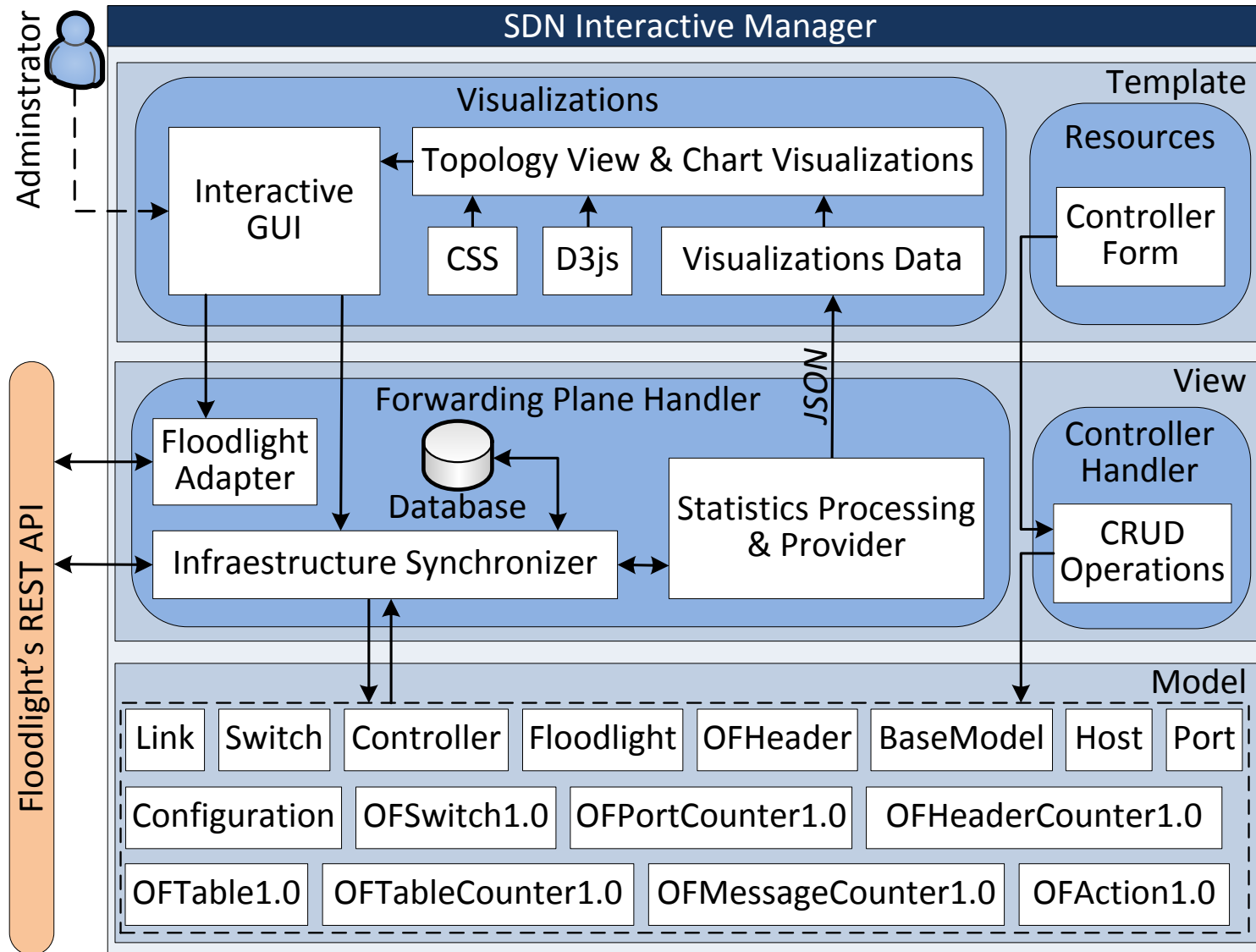
SDN proposals use monitoring information to automate tasks

- *E.g.*, **reduce control traffic overhead** [2] [3] [4]
- *E.g.*, **protecting the network** [5] [6]

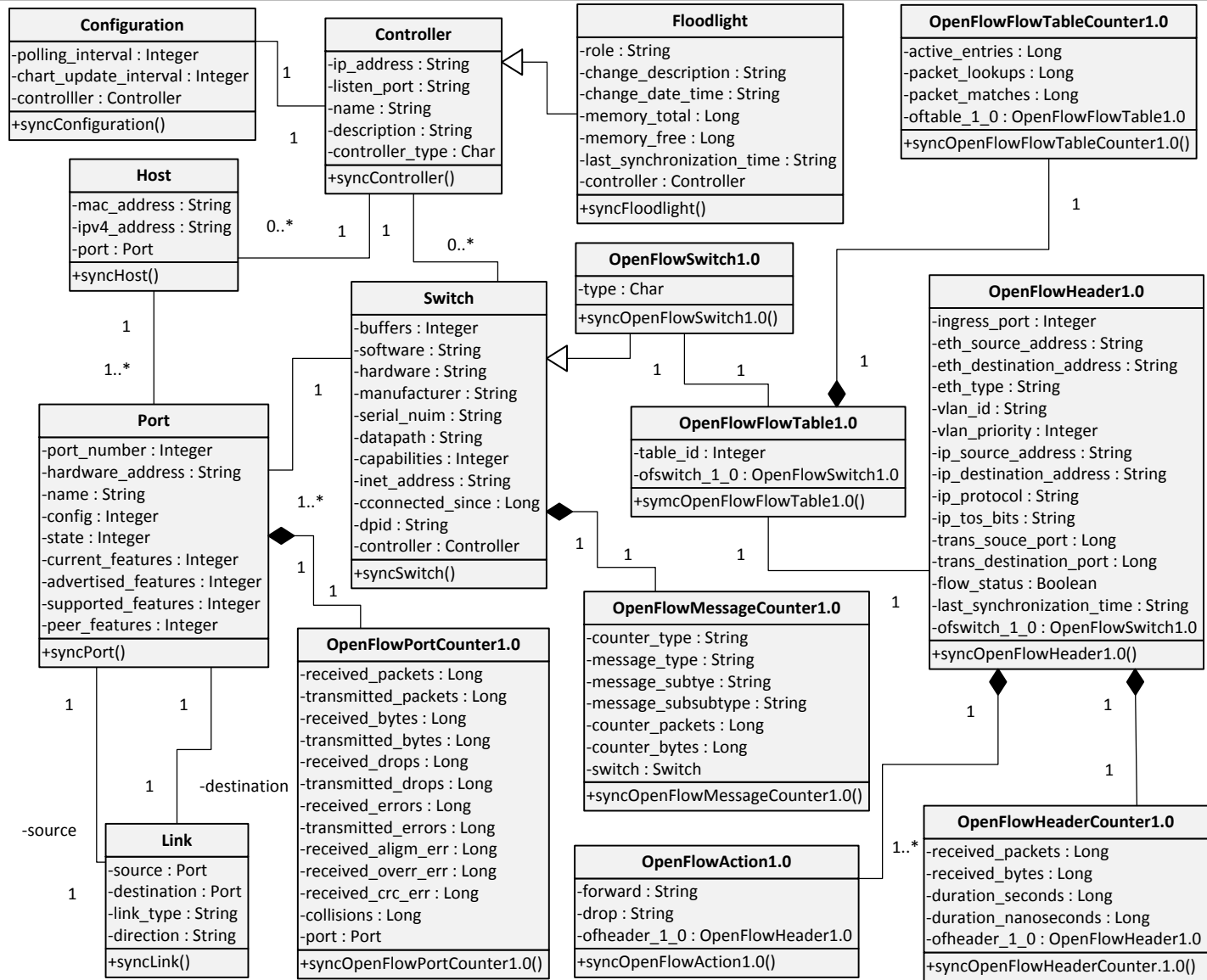
No solution available that aims to help the administrator to understand the network behavior and interact with SDN

- I. *Perform SDN monitoring with configurable polling intervals specifically focusing on inspect resource usage and control channel load metrics*
- II. *Present monitoring information obtained in interactive visualizations that emphasize these metrics*
- III. *Support the administrator interaction by configuring and reconfiguring SDN-related parameters*

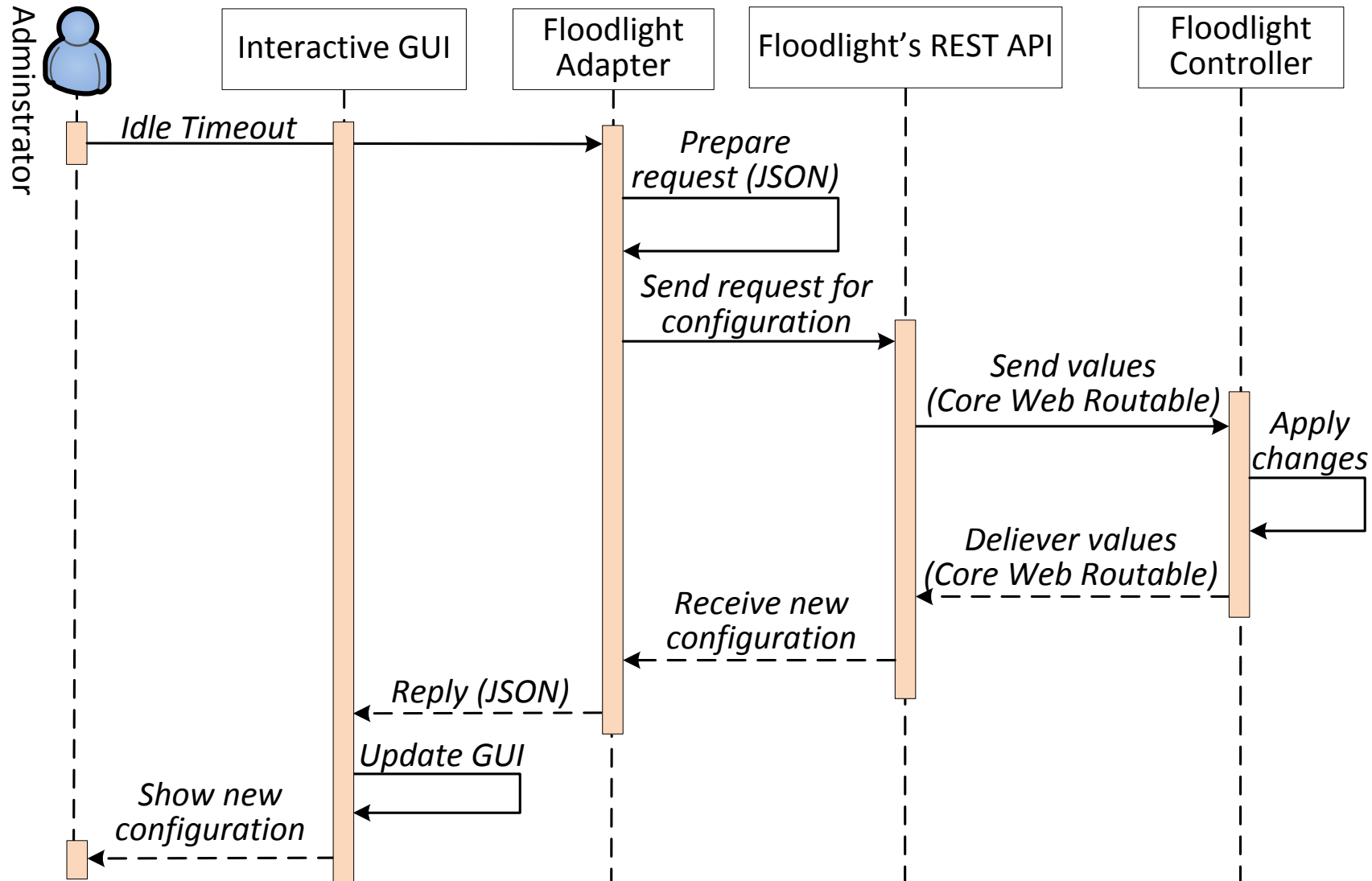
Prototype - Architecture



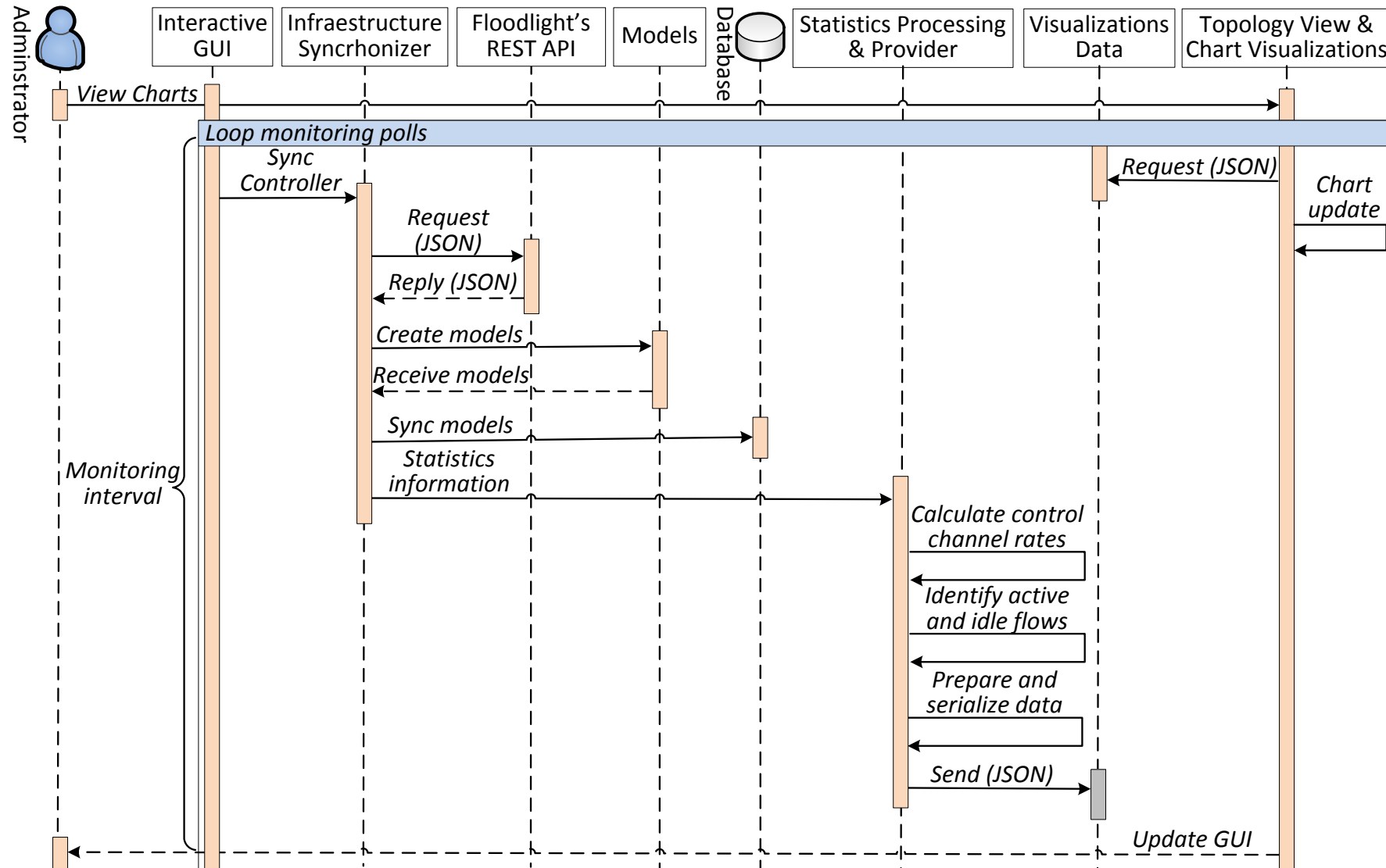
Prototype - Models



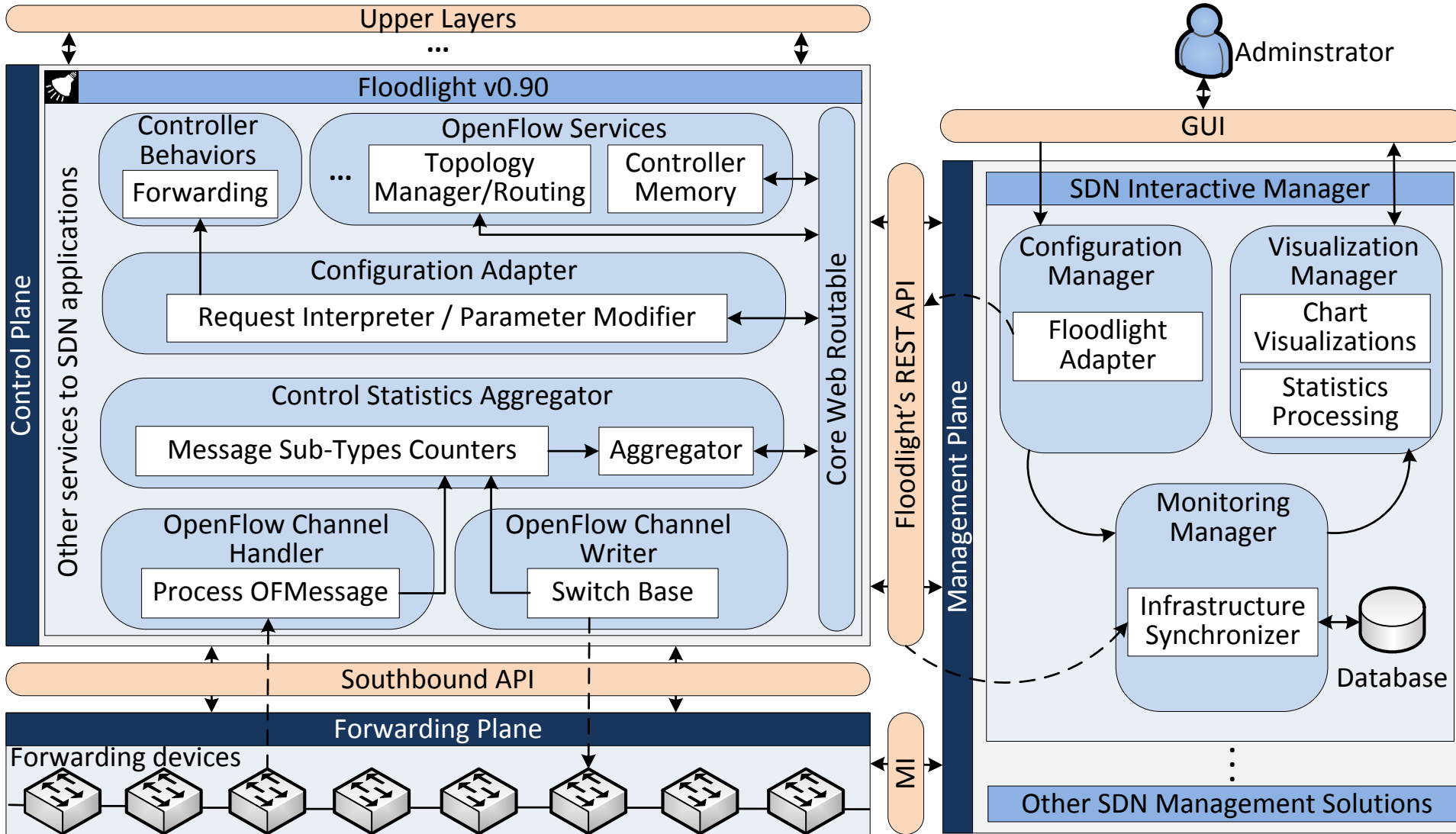
Prototype – Configuration Process



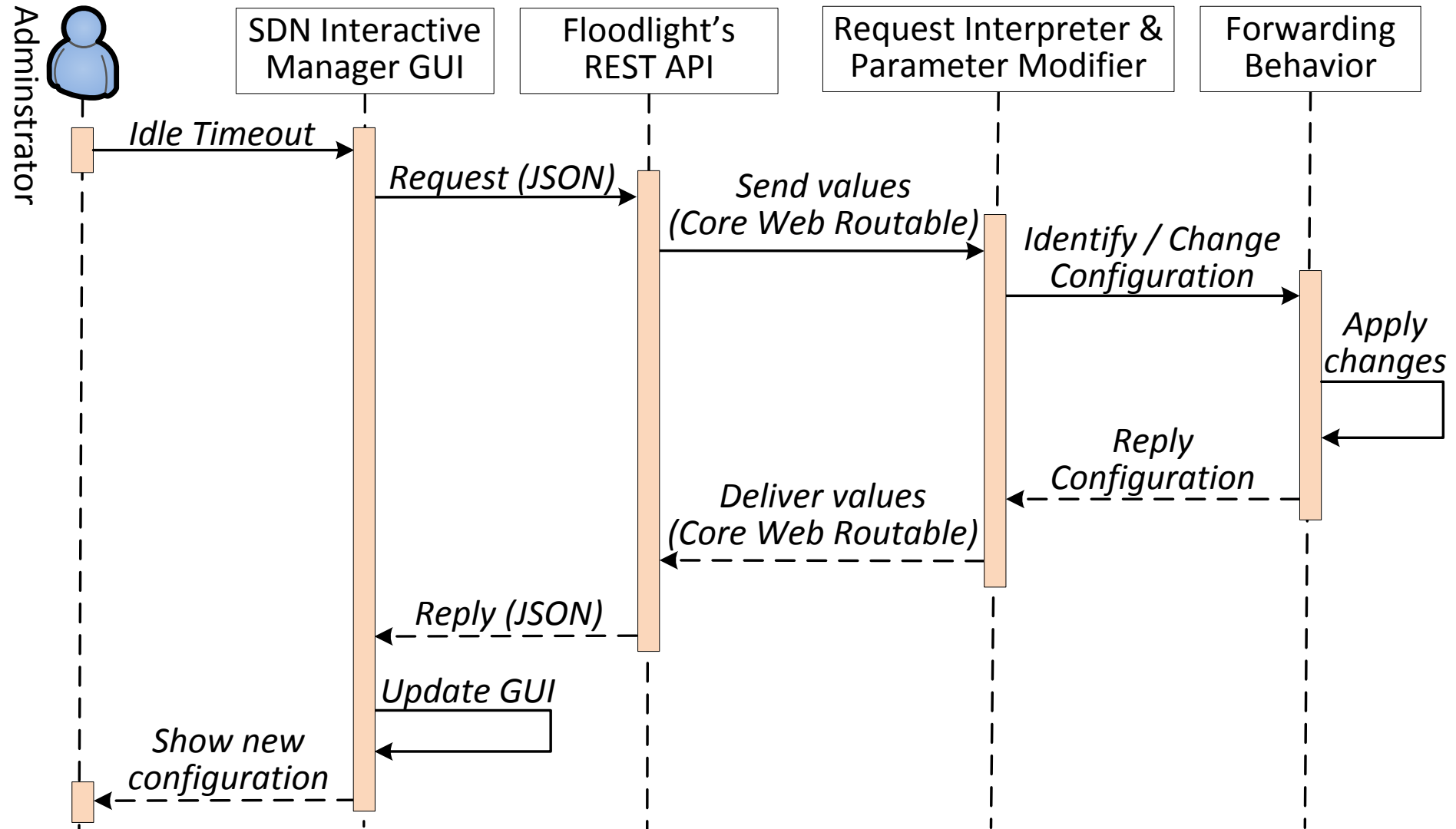
Prototype – Counting Process



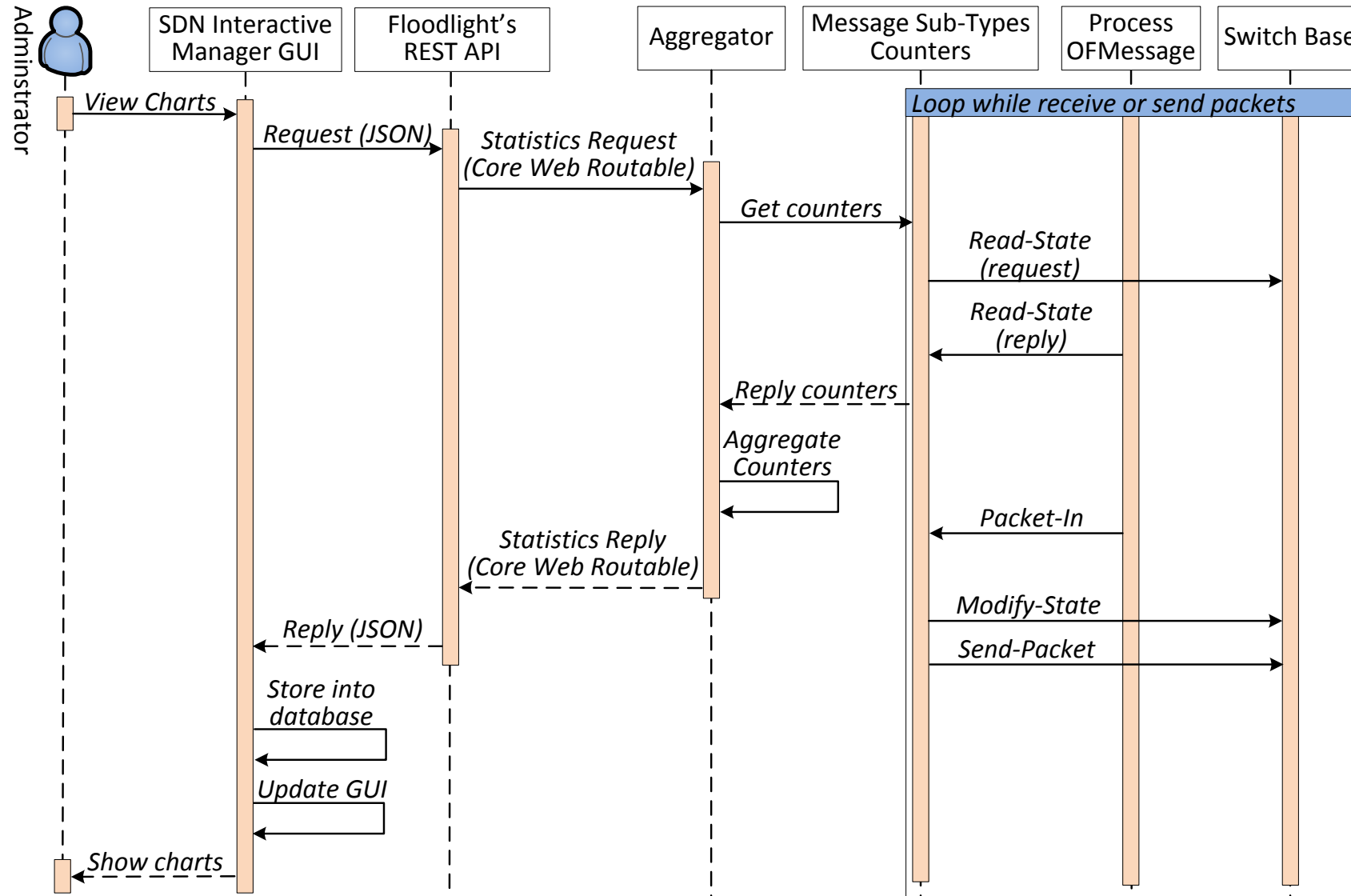
Controller - Architecture



Controller – Configuration Process



Controller – Counting Process



Prototype GUI

Configurations

Topology View

Interactive Charts

Perspectives

Nodes Information

The screenshot displays the SDN Interactive Manager interface. At the top, the browser address bar shows 'localhost:8080/Aurora/sdn/visualizations/data_plane/'. On the left, a 'Configuration' panel is visible with sliders for 'Polling Interval: 20 seconds' and 'Rule Idle Timeout: 5 seconds'. The main area shows a network topology with several switches (Switch 3, 4, 6, 7, 8, 9, 11) and many hosts. A popup window for 'Switch 3' provides detailed statistics: DPID: 00:00:00:00:00:03, Data traffic rate: 1928 kbps, Control traffic rate: IN: 32 kbps, OUT: 110 kbps, Control packets rate: IN: 92 packets/sec, OUT: 23 packets/sec, and Rules (Total/Idle): 72/12. At the bottom, a row of five interactive charts displays various performance metrics over time. On the right side of the topology, there are three perspective icons (a green square with a double arrow, a blue square with a double arrow, and an orange square with a bell icon) and zoom controls (+, -, and a four-way arrow).

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Thank you!

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