SDN-based Control of IoT Network by Brain-inspired Fast-path/Slow-path Bayesian Attractor Model and Network Slicing

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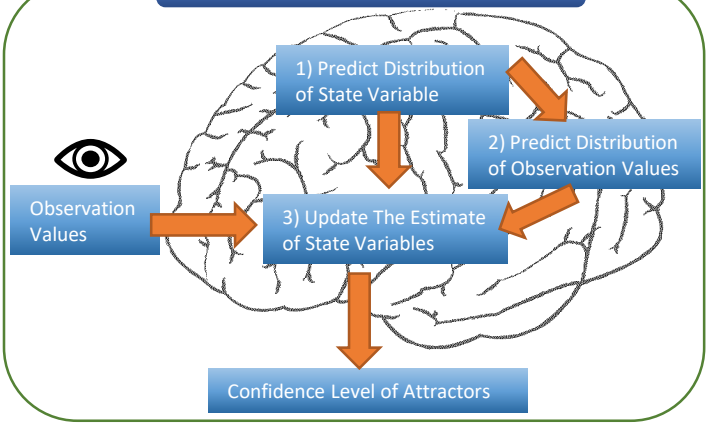
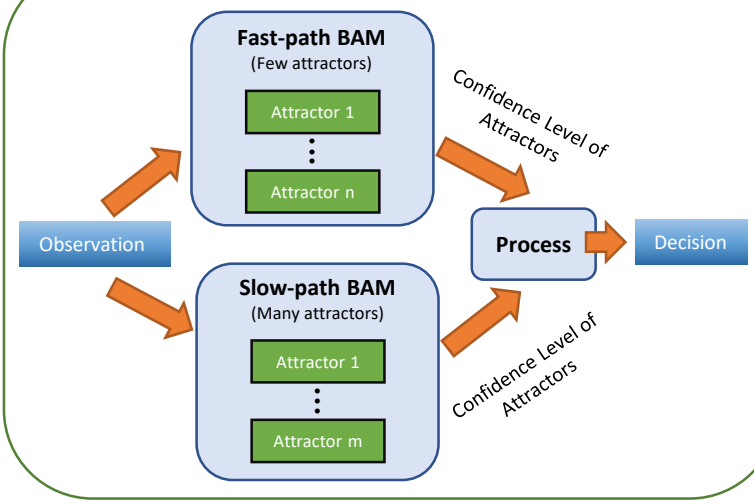
- Traffic engineering in large IoT networks by estimating the traffic matrix is difficult
- Some IoT (Internet of Things) networks exhibit a limited set of network traffic matrix patterns
- We applied brain-inspired Bayesian Attractor Model (BAM), which is a kind of supervised machine-learning algorithm, for identifying the current traffic pattern by using the utilization statistics of edge links
- Expected traffic patterns are stored as attractors in BAM
- Likewise in a brain, we employed a fast-path BAM for faster but low certainty identification, and a slow-path BAM for slower but high certainty identification
- Applies a routing configuration and network slicing optimized for the identified traffic

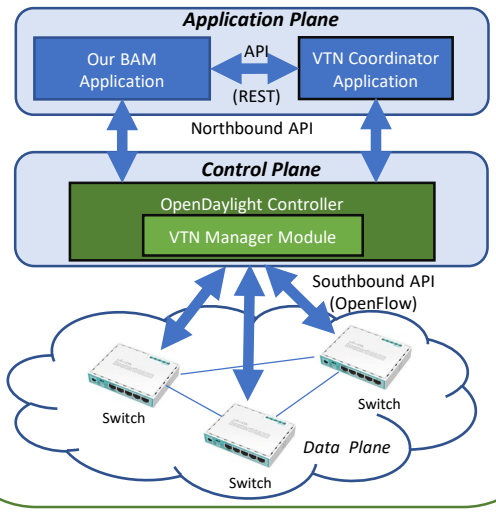
Bayesian Attractor Model



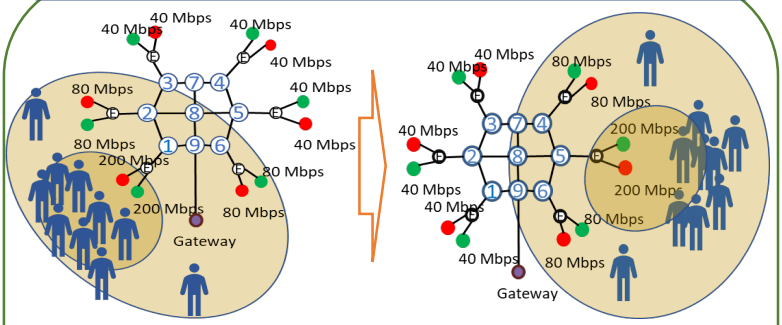
Decision by Fast-path and Slow-path BAMs

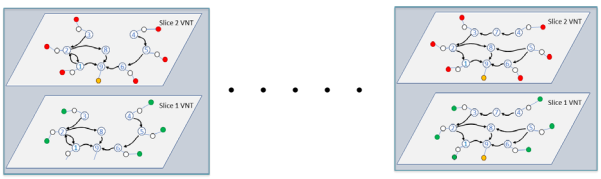


SDN Architecture



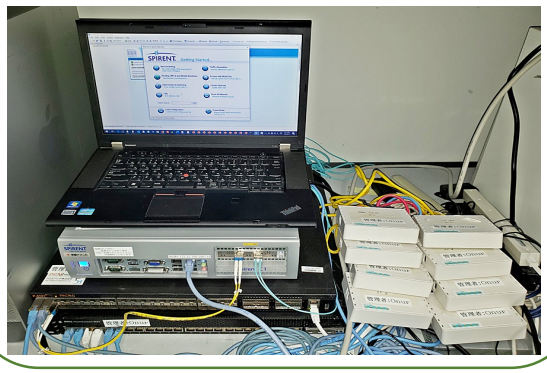
Demonstration of IoT Surveillance Network Optimization





Network Slice Conf. 1 Network Slice Conf. 5

Testbed



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