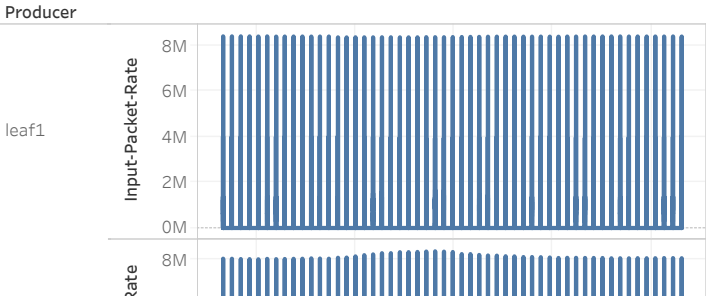


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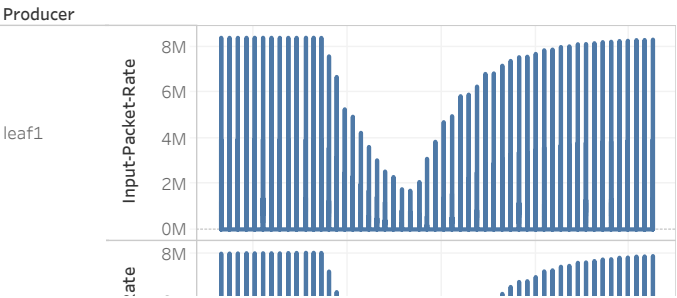
What and Why	Understanding of Network Topology	The Dataset - Training Parameters	Understanding the Task-in-Hand	The Model - Algorithm Flowchart	Model Performance- on Test Set	Further W.I.P. Applications & impact	References & Credits
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- >Predictive Model Development for Network Element Failure Detection.
- >Implementing 'Supervised' learning on the open-source datasets to predict the failure of a particular element in the network. The model implementing the learning algorithm uses prior probabilities with present data in a time series order to make future predictions.
- >Testing the model on 'bgp' clear command that virtually shuts down a particular network element from the network.

Normal Network Element Functioning

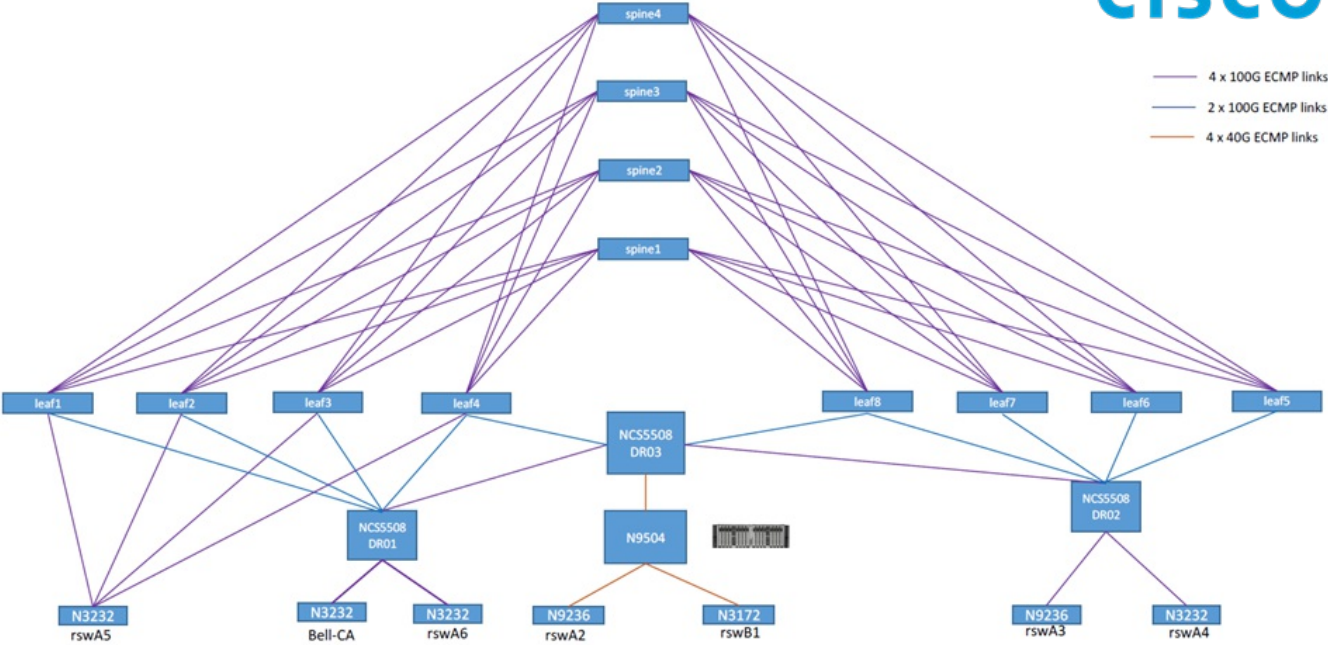


Network Element Failure and Recovery - BGP Clear



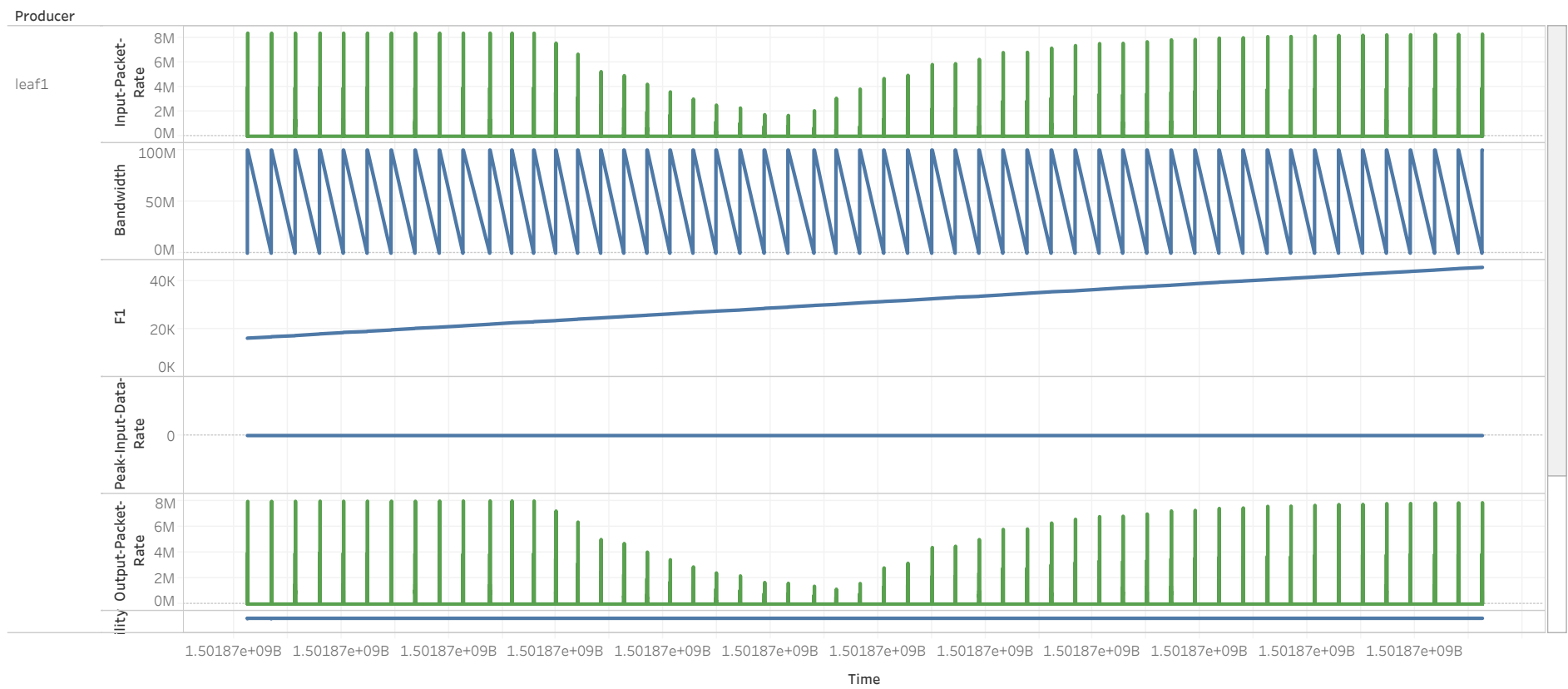
What and Why	Understanding of Network Topology	The Dataset - Training Parameters	Understanding the Task-in-Hand	The Model - Algorithm Flowchart	Model Performance- on Test Set	Further W.I.P. Applications & impact	References & Credits
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Testbed Topology



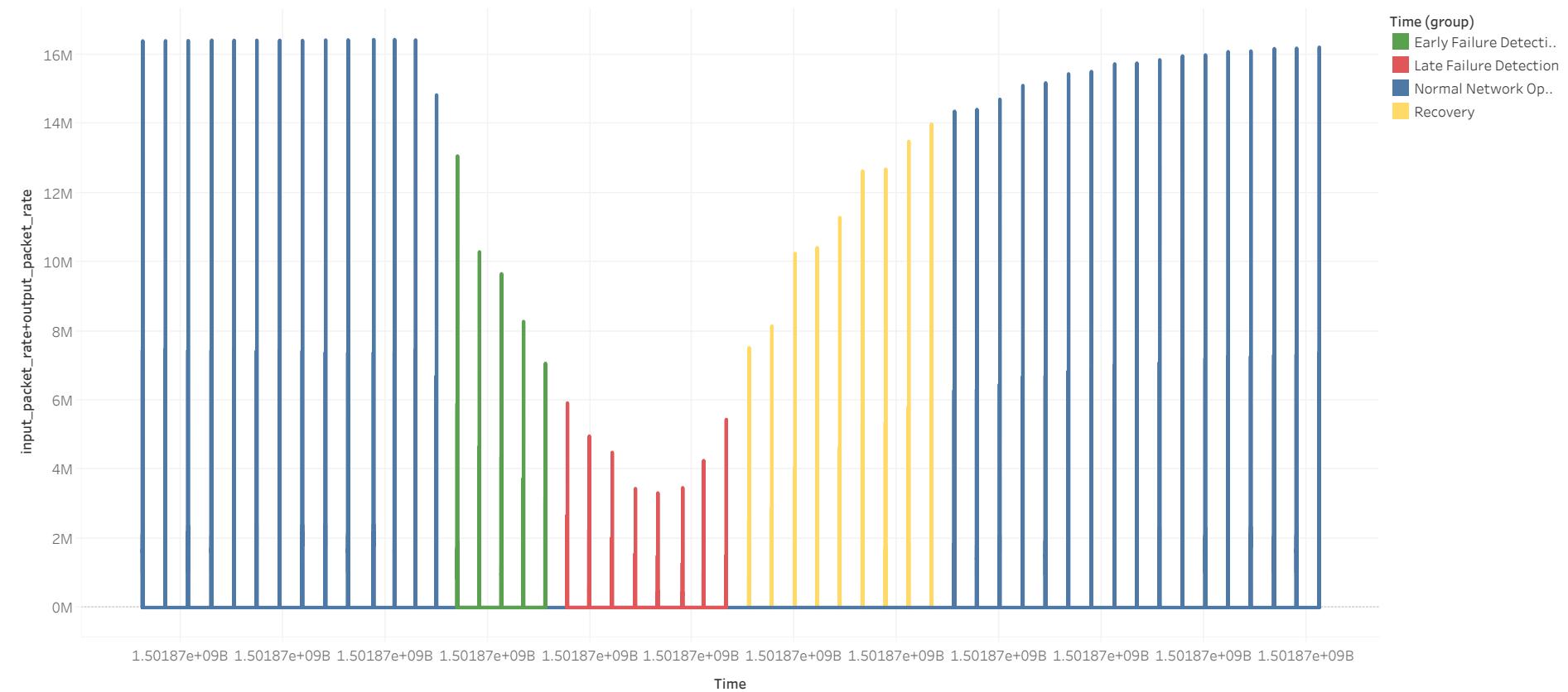
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What and Why	Understanding of Network Topology	The Dataset - Training Parameters	Understanding the Task-in-Hand	The Model - Algorithm Flowchart	Model Performance-on Test Set	Further W.I.P. Applications & impact	References & Credits
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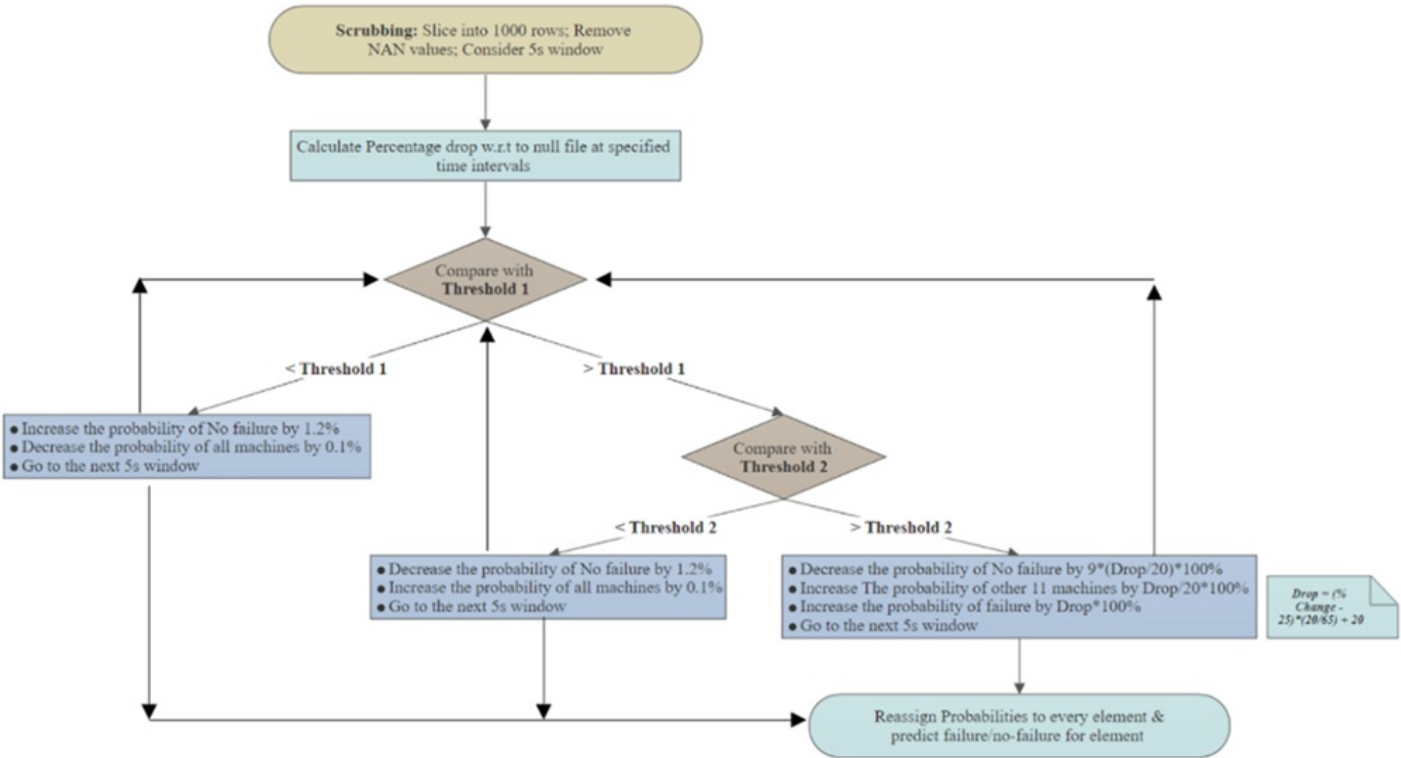
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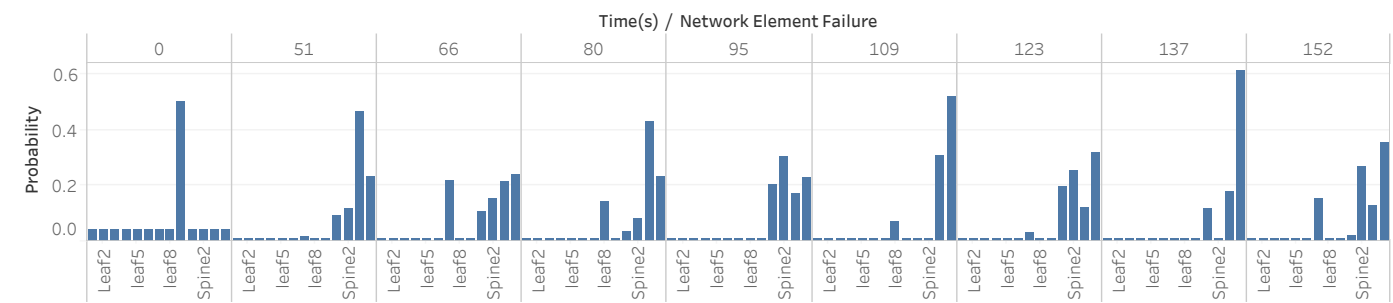
What and Why	Understanding of Network Topology	The Dataset - Training Parameters	Understanding the Task-in-Hand	The Model - Algorithm Flowchart	Model Performance- on Test Set	Further W.I.P. Applications & impact	References & Credits
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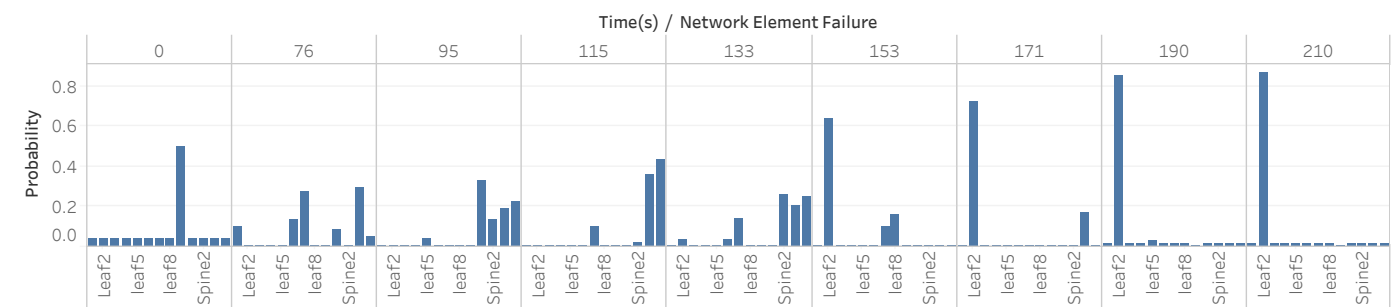
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What and Why	Understanding of Network Topology	The Dataset - Training Parameters	Understanding the Task-in-Hand	The Model - Algorithm Flowchart	Model Performance- on Test Set	Further W.I.P. Applications & impact	References & Credits
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Case A



Case D



Case E



What and Why	Understanding of Network Topology	The Dataset - Training Parameters	Understanding the Task-in-Hand	The Model - Algorithm Flowchart	Model Performance-on Test Set	Further W.I.P. Applications & impact	References & Credits
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Futher Work in Pipeline:

- >Develop mechanisms to utilize the test data as training data[once probabilities are calculated] to implove on the thresholds of the model.
- >Develop extensions of the algorithm/model to predict other failures such as 'Port Fault' etc. The extensions to also predict multiple network element failures occuring at similar time instances.
- >Publish the scrubbed and refined datasets on <https://www.kaggle.com/> as a Client Sponsored Competition. Competition to target Data Science enthusiasts to detect various network anomalies.

Applications & Impact:

- >**Reduced Costs:** Model to help re-route traffic and avoid 're-boot' costs.
- >**Risk Mitigation:** Enable high QoS delivery by reducing 'down-time'.
- >**Cross-Industry Applications:**
Predictive model developed can be implemented for solving various business

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References:

> Project documentation and Python code:

https://github.com/nanduriprabhakar/Data_Science_Team_Project

> Cisco Network Data-set[Open Source]:

<https://github.com/cisco-ie/telemetry>

Credits:

> **Prof. Daniel Egger** [Executive in Residence, Pratt. School of Eng.] - Fundamentals of Data Science course.

> **Rachel Brady and Drew** [Cisco Systems] - Telemetry Data (open sourced)

> **Chinmay Ajnadkar** [Teaching Assistant] - Model Validation and Test Results Verification