

# Modeling the Active and Idle Durations of Network Hosts

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## Introduction

Important to understand network behavior of hosts

Durations active and idle

Patterns important for Situational Awareness

Baselining to detect anomalies

Decide whether a host should be in the inventory

## **Objectives of the Analysis**

Distributions of the durations of active and idle times

Insights

Two metrics:

Probability of a host being active after a period of idleness

Conditional probability of a host becoming active within a time horizon Given it has been idle for some time

# Methodology

Flow data from the public domain

SiLK (CERT/SEI) and Unix Tools

Spreadsheets

Focus on web servers

## References

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# **Analysis**

Time series of network flows – out traffic

Time horizon = 23 hours

Time scale (bin size) = 1 hour

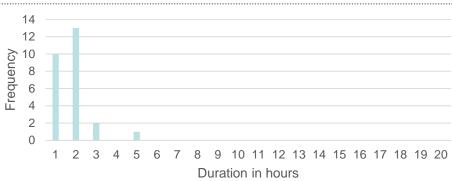
Convert volumes to a 0/1 series

Compute the durations of active and idle times

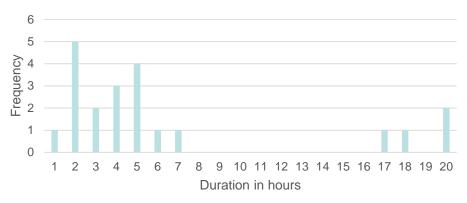
Plot the frequency distributions

## Results

#### Distribution of active durations



#### Distribution of idle durations



## Discussion

### Active durations

Very compact (low variation – narrower than Poisson) Mean = 1.8Weibull?

#### Idle durations

Long tail or two populations Issues with estimating the metrics Censoring/Truncation problems

#### **Future Work**

Need much longer time series Need to estimate the metrics with more data sets Effects of varying the time scales and time horizons





Thank you!

**Questions/comments?** 

