# Quantifiable Metrics of Home Router Security Using Open-Source Documents

Sreean Reddy Rikkala, Alexandria Simonson, Ryan King, Corey Mekelburg

*University of Nebraska at Omaha*

## Abstract

Consumer residential routers have a privileged multipurpose position as the gatekeeper of external threats and also perform sensitive internal networking functions. This intermingling of external and internal functionalities places consumer networks as a valuable target for external threat actors. As such, it is essential that these devices utilize a wide variety of cybersecurity controls to ensure that the consumer's home network is properly protected. However, an issue arises when consumers are tasked with selecting routers that have implemented proper cybersecurity controls. The consumer must choose between relying on the ISP to provide and implement a secure router or purchasing and configuring their own. This task becomes increasingly difficult as the breadth of available devices and manufacturers grows. Faced with this difficulty, our research team proposed the question: what quantifiable metrics can be used to assess the security of home routers from openly available documentation? This research paper analyzes currently accepted cybersecurity best practices for consumer home routers and attempts to align controls in an objective and consistent grid that takes into account the default settings for each control. The produced grid is tested among our researchers by individually evaluating several routers and comparing the deviations between each researcher. Finally, suggestions are made on improvements to the grid and further areas of research towards securing consumer residential routers.

## Introduction

1. Iterate the importance of routers in a home network, backed up with the “80% of home networks have a router” statistic.
2. (citation needed) Back up this argument with data regarding consumer network security literacy.
3. State our research question again and explain it as an aid to the consumer network security problem.
4. List our research methodology succinctly and the goals we hope to achieve.
   1. Evaluation Grid
   2. Criteria (different measurements)
   3. Categories (placing criteria into reasonable groups)
5. State our “success criteria”, or what we define as a successful outcome.
   1. Criteria that are consistently repeated.
   2. Criteria that can be evaluated objectively.

## Literature Review

## Selecting Criteria

### Goals of Criteria

### Categories

### Criteria

## Evaluation Grid

### Explanation

### Trials Across Evaluators

## Conclusion