

# AfriNREN Dashboard Usability Test

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## Networking Primer

There are two networking concepts that are necessary to understand before using this visualisations.

### **Autonomous Systems (AS)**

ASes are networks or group of networks controlled by an organisation. Each AS is assigned an AS number (**ASN**) which it can be identified by.

### **Ports**

A port is a logical endpoint (meaning it is not physical) that helps direct information that is communicated between computers. Understand that Web pages are requested by connecting to port 80 of the Web server from the client's pc and that other ports have *recommended* purposes such as Peer-to-Peer (P2P) traffic etc.

## Visualisation Overview

The AfriNREN Dashboard aims to visually display summary data on internet traffic as seen from an institution that has captured and recorded the data.

Two views are presented:

1. **Busiest AS communication partners**

A network graph showing the busiest communication partners (two ASes that transfer data between them) and

2. **Largest sources of traffic (AS)**

A row chart showing the traffic breakdown from the ASes that are the source of the most traffic. The traffic is broken down by port.

## AfriNREN Dashboard: NetFlow Data Captured at KENET

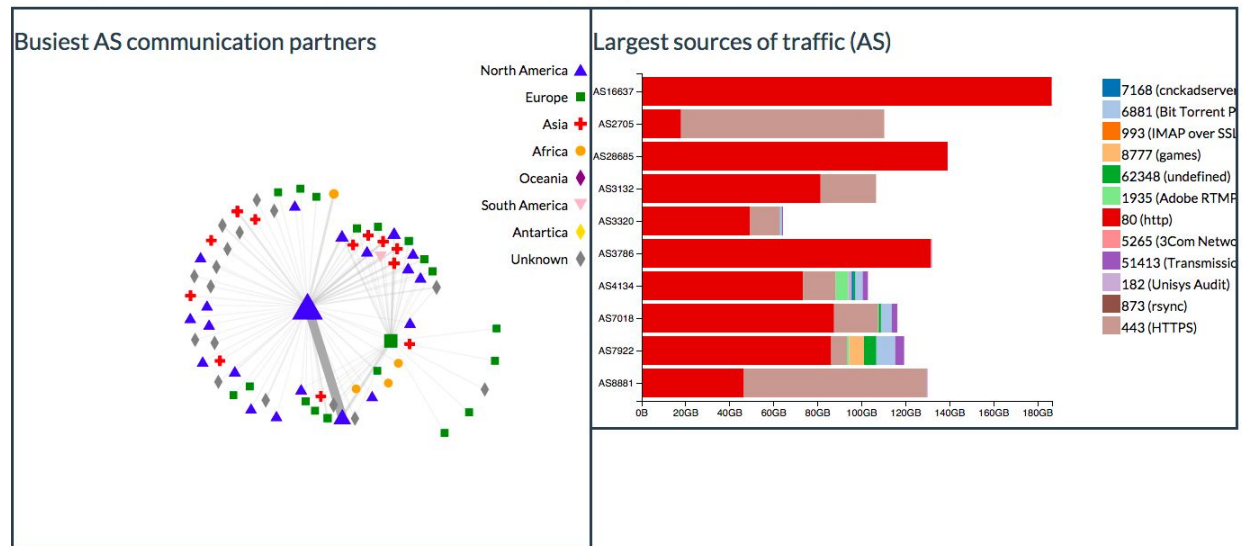


Figure 1: AfriNREN Dashboard

### Busiest AS communication partners [Graph]

The nodes in the **Busiest AS communication partners** are each a unique Autonomous System (AS). The symbol of the node indicates the continent on which the AS is located. The size of the symbol indicates the amount of traffic that the AS has sent and received in the past. The links between the nodes indicate which ASes have exchanged traffic in the past (called communication partners) and the width of that link indicates how much traffic was exchanged (in bytes).

- North America ▲ The **Busiest AS communication partners** graph supports exploration of the data through interactive manipulation of the graph nodes. Feel free to explore the graph by clicking and dragging the nodes around.
- Europe ■
- Asia +
- Africa ● The graph also allows for extracting detailed information of the nodes in the graph through a 'detail-on-demand' pop-up which is displayed when you hover your mouse over a node in the graph.
- Oceania ◆
- South America ▼ The key seen on the right edge of the graph shows which symbol represents which continent.
- Antartica ◆
- Unknown ◆

Figure 2: Graph Continent to Symbol Key

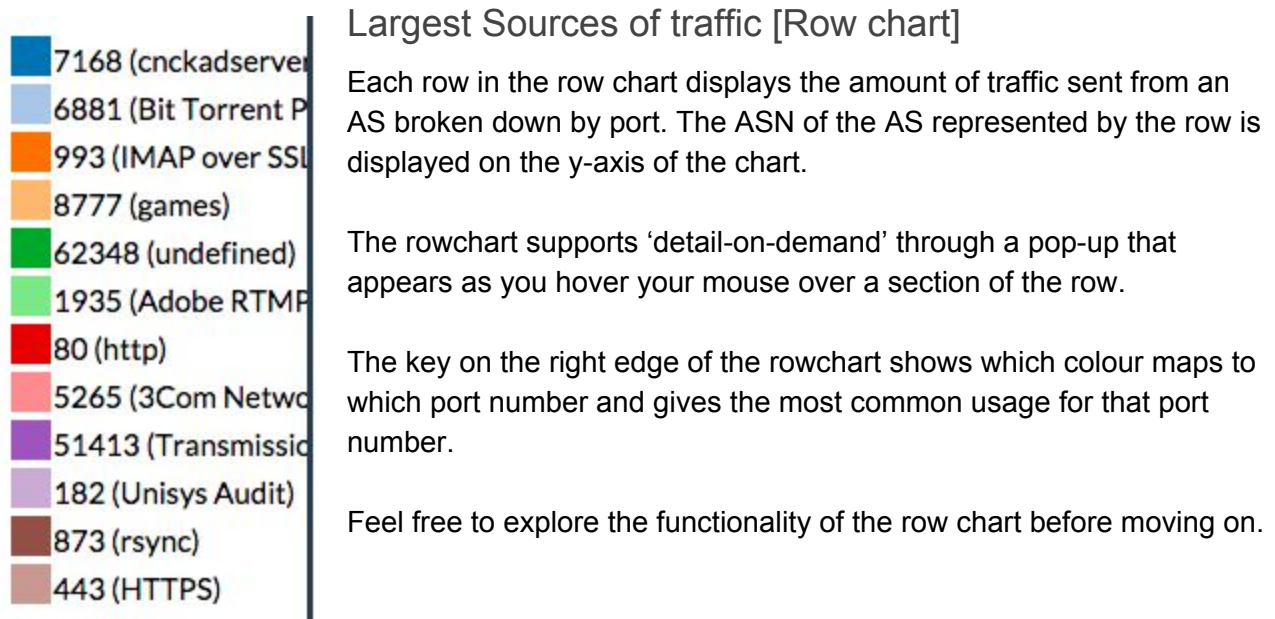


Figure 3: Rowchart colour to port number key

## Walkthrough

This section is a warm-up exercise that encourages you to explore the visualisations before you begin the tasks. Ask questions if you are stuck or curious about a feature in the visualisation. Please navigate to the following link: [http://196.24.\\_\\_\\_\\_\\_.\\_\\_\\_\\_\\_:8000/](http://196.24._____._____:8000/)

1. In the pane labelled 'Busiest AS communication partners', hover your mouse over the largest green square. The detailed information for that Autonomous System is displayed as a tooltip.
2. The size of the symbol displays the number of bytes transferred to and from that AS.
3. Using the legend on the right hand side of the same pane, identify the symbol for an AS located in Africa ( ● ).
4. The width of the link between two symbols displays the number of bytes transferred between the two symbols.
5. The following steps involve the bar chart in the pane on the right of your screen:
  - a. The bar chart shows the breakdown of traffic sent by the largest sources of traffic.
  - b. Hover your mouse over the red rectangle in the column labelled AS7922, see the detailed information of the AS, the number of bytes sent from that port to all destinations and the most common use of that port.

Once you feel acquainted with the various interactions of the visualisation, please answer the following questions. You can refer back to previous sections for reference.

# Tasks

Please perform the following tasks to the best of your ability, aiming to answer the questions correctly within a reasonable amount of time. If the task is proving to be difficult, please note so on your answer. If you want clarification on a question or help with the visualisation please ask me.

1. Which two Autonomous Systems (ASes) exchange the most traffic? Please write down their ASNs.

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2. Which AS is the busiest (sent or received the most traffic) in Europe? Please write down the ASN.

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3. How much traffic was exchanged to and from the busiest AS in Europe?

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4. Which AS is the busiest?

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5. Which African AS transferred the second most traffic with AS174?

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6. Are there more ASes represented from Africa or Asia?

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7. Which AS in Africa is the busiest?

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8. How much port 80 traffic was sent from the above AS?

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9. Which AS is the second largest source of traffic?

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10. Which AS is the largest source of HTTPs traffic?

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11. How much traffic was sent from port 6881 from AS7922?

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12. List the ASes which sent more HTTPS traffic than HTTP traffic.

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13. How much port 80 traffic (in gigabytes) was sent from the source of the most port 80 traffic?

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## Usability Questionnaire

Please navigate to the following link and answer the questionnaire:

[Dashboard Visualisation - Usability Questionnaire](#)

Alternatively, if the above link does not work, please navigate to the following url:

<http://goo.gl/forms/WvCDh0L5dH>