ESnet’s Network Visualization Toolkit

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2015 Technology Exchange
Cleveland, OH
5 October 2015
Introduction

• Architecture
• Motivating Examples
• Our Approach
• Time Series Charts
• Network Diagrams
• Pond: Time Series Operations
• Demo
• Open Source
Architecture

We are here
MyESnet Portal

A data-driven website for displaying information and visualizations about ESnet, its sites and community.

https://my.es.net/
The “Mini Portal”
Our Approach

• Components
  – Reusability
  – Composability
  – Declarative

• Leverage existing tools and libraries
  – Use existing code whenever possible
  – Write code only when necessary

• Iterative Development
  – Get feedback often
  – Do the minimum first, then see what you need to add (or remove)
Components

• Reusability
  – Each component is made to be a general as possible
  – Surprisingly, general solutions are often simpler than one-offs

• Composability
  – Each component has clear boundaries and interfaces
  – Components can be flexibly arranged as needed

• Declarative
  – Declare what you want, not how to do it; the system “makes it so.”
  – Allows work to be done at higher level by focusing on domain concepts
Declorative versus Imperative

**Imperative:** Your friend tells you:

First you go down route 3, until you pass the old farm
Then you turn right at the big rock
After that you’ll see a red brick house on the left

... 

**Declorative:** You enter “1313 Mockingbird Lane” into your GPS
Time Series Charts
Time Series Charts
Network Diagrams
Pond: Time Series Operations

- We have lots of time series data: SNMP, netflow, log messages, etc
- Need a common abstraction and wire format for this data
- Provides common operations

Animation showing how Pond generates summary rollups
Demo

Building the mini portal
Step by step
Open Source

Good news everyone! It’s all finally available!

- [http://software.es.net/pond/#/](http://software.es.net/pond/#/)
- [http://software.es.net/react-timeseries-charts/#/](http://software.es.net/react-timeseries-charts/#/)
- [http://software.es.net/react-network-diagrams/#/](http://software.es.net/react-network-diagrams/#/)

Motivation

- Develop a common toolkit for visualizing networks
- Lower barrier to entry
- Allow people to use what we’ve built so they don’t have to build their own
- Encourage others to share their visualizations
- Give back to the community
Questions?

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https://my.es.net/
http://software.es.net/
http://software.es.net/pond/#/
http://software.es.net/react-timeseries-charts/#/
http://software.es.net/react-network-diagrams/#/
http://fasterdata.es.net/

Like code and networks?

Join us for the Netcoders BOF, Tuesday 7:30p in Room 14

Thanks for listening!