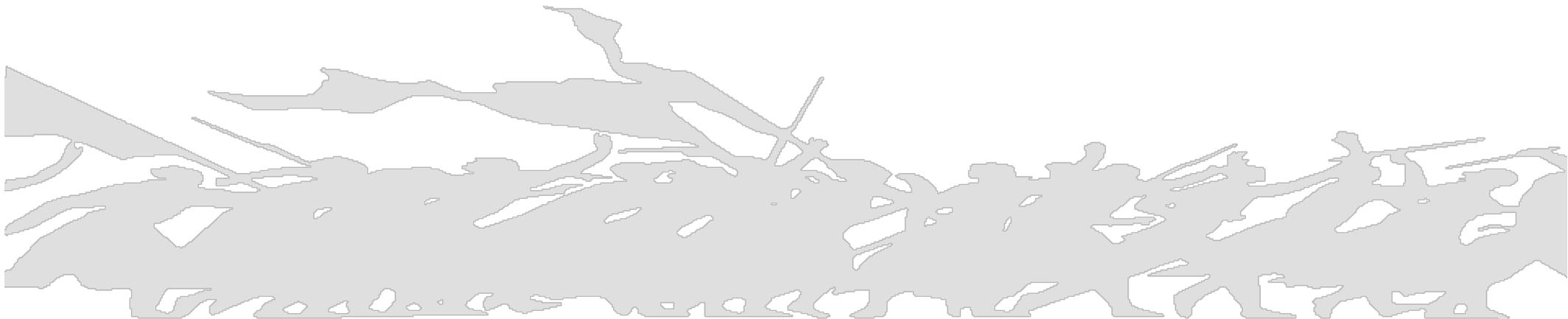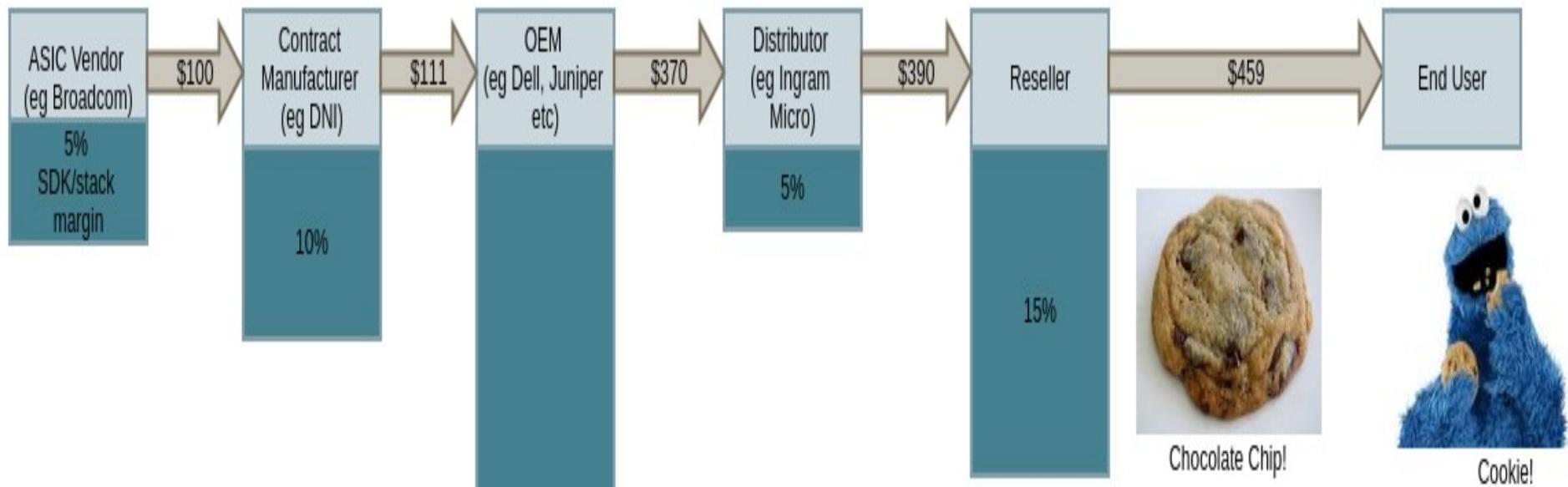# The Open Source Networking Revolution

Jamal Hadi Salim
Mojatatu Networks

Network Equipment Supply Chain

The Operator Dilemma

- Network Traffic growing at exponential rate
    - 1 Zetabyte by end of 2016
        - More than double by 2020
- Capital Cost increasing at the same rate
    - Cookie monster is getting very hungry
        - Cookie Monster also wants Banira Ratte flavor
- Operational costs increasing
    - More boxes to manage require more staff
- Profit margins per user going down
    - Need to add more services at a faster rate

The Operator Dilemma: Reduce Costs

- Increase Operational Efficiency

  - Do More with Less

    - Less Hardware

    - Less Humans

- Decrease Capital Costs

  - Revisit Supply Chain

Cut Down Those OEM Margins

- Value add happens earlier in the chain
  - That large OEM margin is not justified
    - Innovation at the OEM level is not significant
- Make Linux the Network OS
  - Robust networking
  - Minimum viable infrastructure already open source
    - Routing daemons etc

Cut Down The Middle Man: Empower The ODM

- ODM supplies basic OS infrastructure
  - Provides third level support
    - Makes more margin
- Shrink the chain
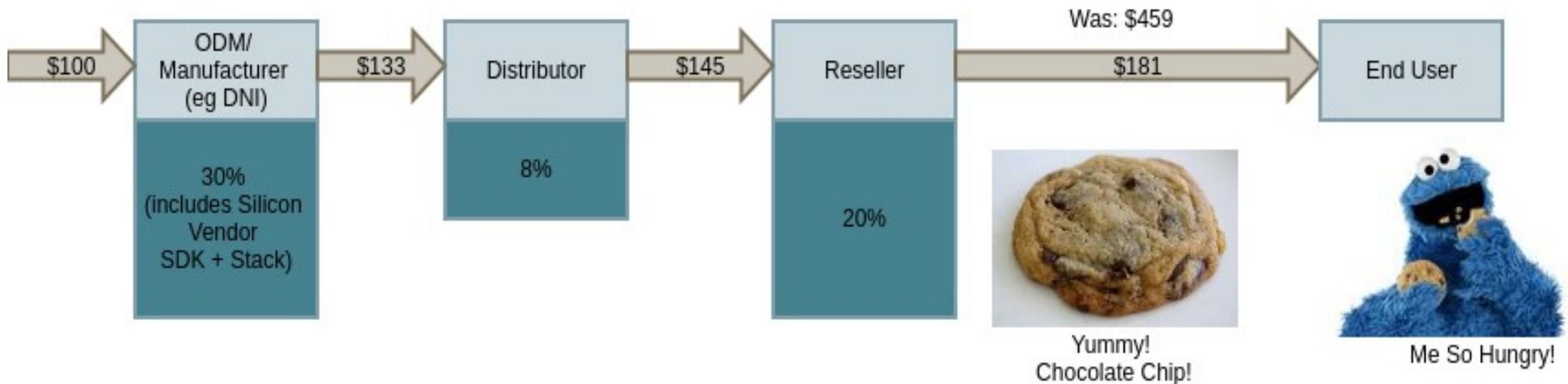
New World Order: Empowering The Operator

- The operator takes control
  - The network box is a linux server
    - No vendor dependency/lock-in
      - Skills more widely available
      - Linux APIs are consistent
  - Service Creation Velocity
    - SDN/Provisioning enablement

Introducing Linux Switchdev: Goodbye Proprietary APIs

- An ASIC driver in the kernel

    - No more SDK or API lock in

    - Faster time to market

        - Pick the sillicon based on your needs

        - No need to re-write your software for every sillicon

ASIC Vendor Challenges

- Hard to get rid of traditional Profit Centres

  - SDKs and stacks

- View that SDK offers differentiation

- View that SDK has Intellectual Property

 - As silly as registers access requiring legal clearance

Cut Down Expenditure:
Do More For Less

- Squeeze as much out of the hardware
  - Use commodity hardware where possible
    - Linux TC
      - NIC offload
      - NPU offload
      - Performant software
    - XDP + EBPF

- Use Less Humans
  - Standard Linux admin tools well understood
    - Automation to reduce operational costs
    - Blue or Red or maybe Green Pill

# Improving Profit Margins: Acceleration Of Service Creation

- Inject more Open Source and ISVs in chain

    - SDN + Provisioning Automation

    - Give the Cookie Monster a cookie machine

- Merge Distributor and Reseller

    - Reduced Support Cost

        - one neck to strangle: Integrator

            - For now...
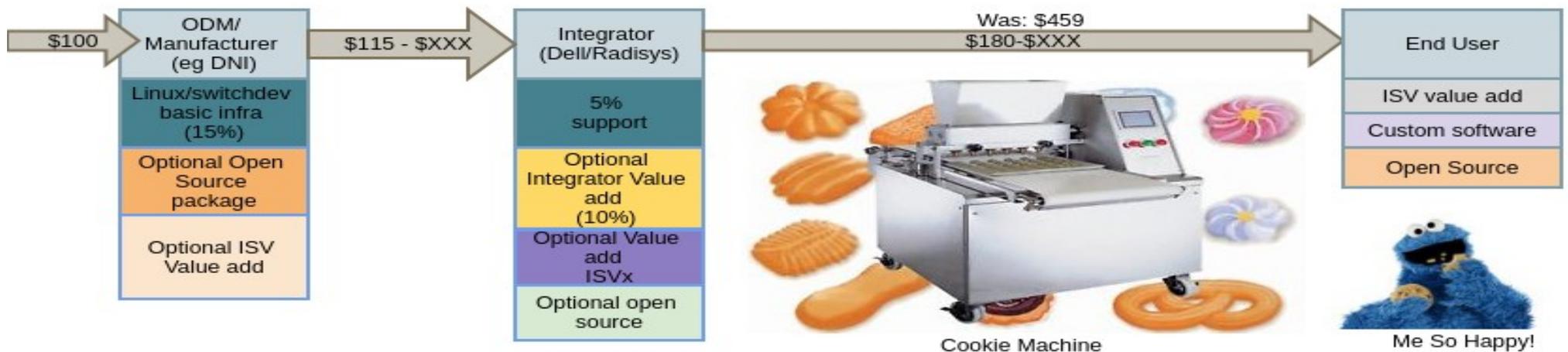
The New Supply Chain
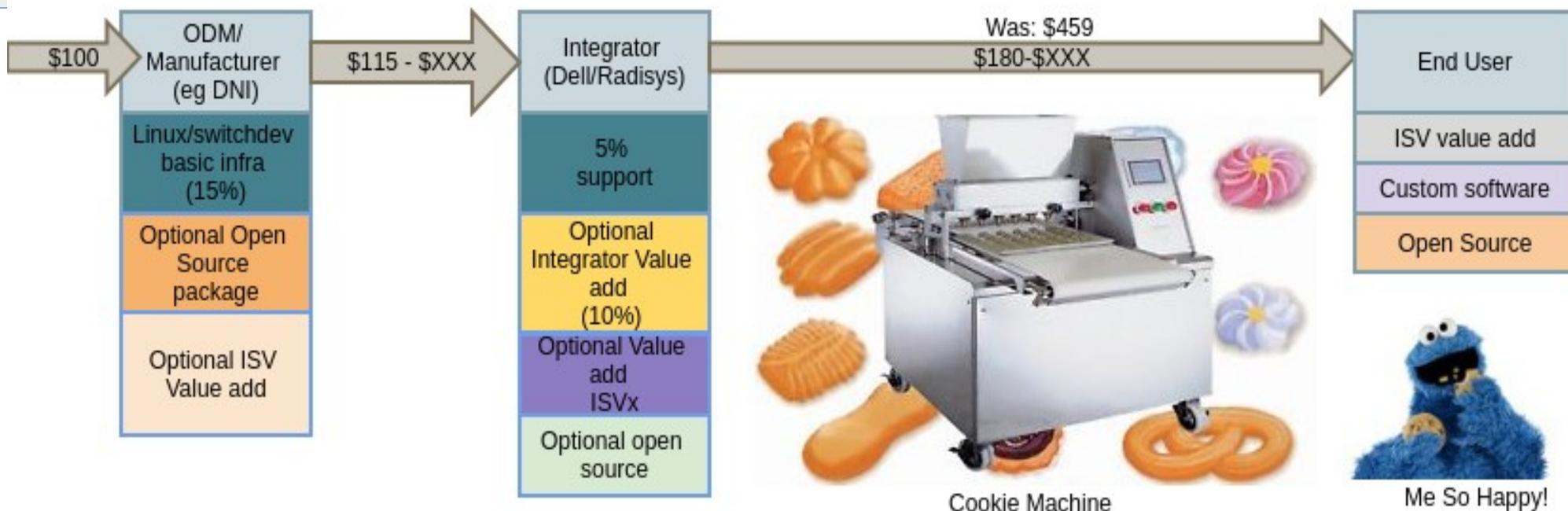
- Basic Software Infrastructure based on Linux
  - A lot of viable open source networking infrastructure
  - With room for ISVs and support
- Commodity Off the Shelf Hardware

Network Equipment Supply Chain

The Open Source Networking Revolution

Comes in a
Nice box labelled
Yummy Cookie
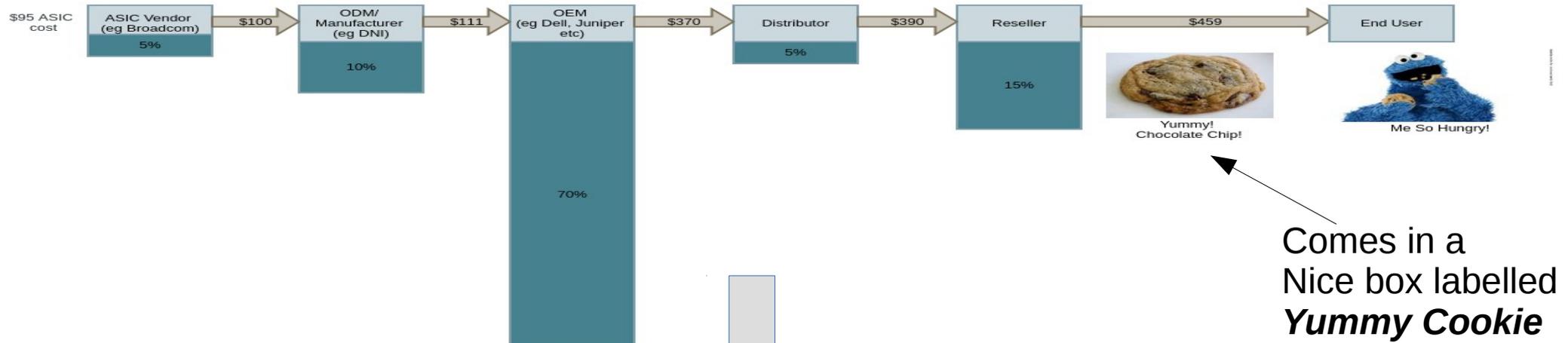
Televising The Revolution: The Netdev Community

- Discussions happen on the mailing list
    - netdev@vger.kernel.org
- 2 times a year face to face meetings
    - Netconf
        - Small by-invitation only
    - Netdev
        - Open to Public
            - Paper talks
            - Tutorials
            - Workshops
            - BoFs

# Televising The Revolution: The netdev conference

- www.netdevconf.org

  - Netdev 0.1: Ottawa, Canada - Feb 2015

  - Netdev 1.1: Seville, Spain – Feb 2016

  - Netdev 1.2: Tokyo, Japan – Oct 2016

  - Netdev 2.1: Montreal, Canada – March 2017

  - Netdev 2.2: Seoul??

- Intent is twice a year

  - We go where the community wants us to

How To Be Part Of The Revolution

- Participate in the mailing list
  - Everyone is helpful
- Show up at netdev
  - Easier to talk to atoms than electrons
- Culture of execution-first and pragmatism
  - Moves fast in comparison to corporations
    - Took one year from discussion to execution of switchdev
  - Not immune from Bike Shed discussion
    - Strong personalities

"한국 개발자들을 환영합니다."
"Korean developers are warmly welcomed"
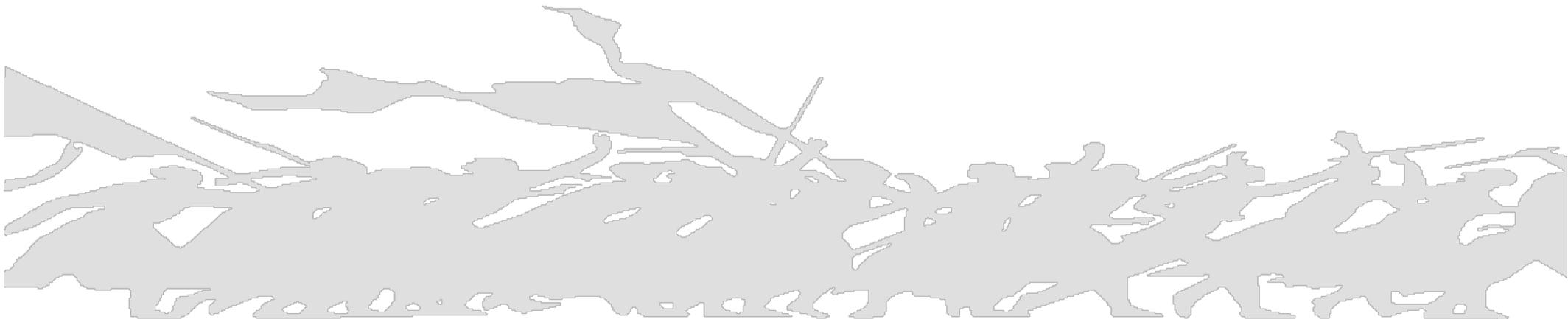
References And Acknowledgement

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  - Cumulus Networks Blog

- Damascene Joachimpillai

  - Netdev 1.1 Keynote

- CISCO Service Provider Forecasts and Trends

  - http://www.cisco.com/c/en/us/solutions/service-provider/visual-networking-index-vni/index.html

- Taek Wan Kim @BlackDuck Software Korea

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