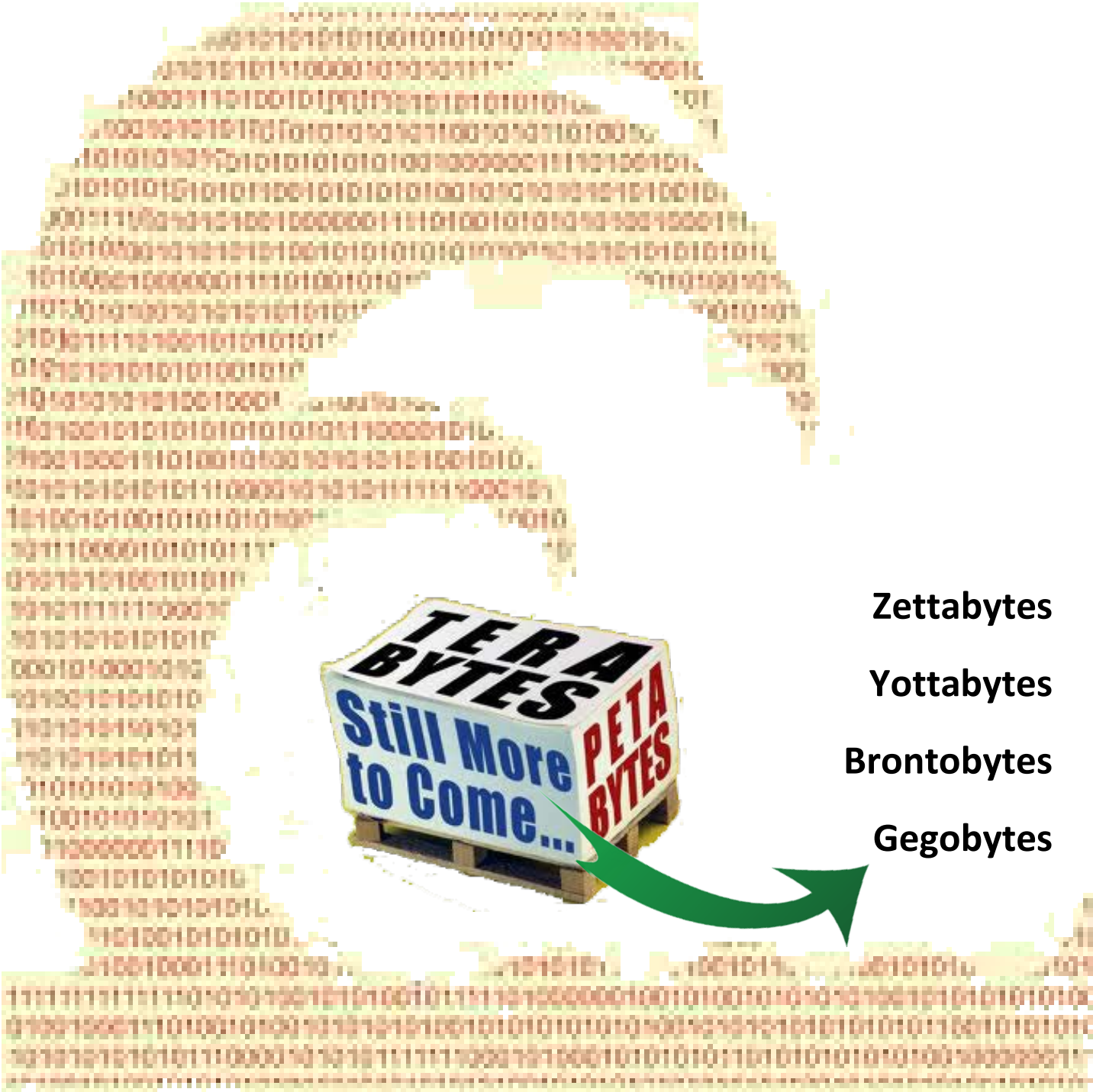




You Think You Have a Data Tsunami Now?



Zettabytes

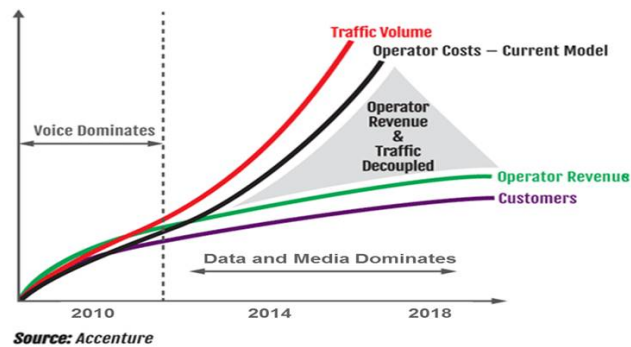
Yottabytes

Brontobytes

Gegobytes

Introduction

A dramatic shift in the way telecom networks are used happened in 2010. The then voice-centric networks evolved to be more data-centric. The evolution of the Internet and the ever demanding quest for real-time information were the largest contributing factors. The growth of the IP networks is now reaching epidemic proportions as the data demand per subscribers is ever-increasing. As explained in this chart from Accenture, the problem rapidly gets worse over time.



The operator costs are in step with the traffic volume but the revenues, which are based on customers, are flattening creating an ever-growing gap, an unsustainable model for network providers.

Network Growth Trends

[Cisco says](#) "global IP traffic will pass the zettabyte threshold [a zettabyte is a billion terabytes] by the end of 2015, and will reach 1.4 zettabytes per year by 2017." That by itself is remarkable, but even more so when viewed in historical context. Cisco offers the chart below.

Year	Global Internet Traffic
1992	100 gigabytes per day
1997	100 gigabytes per hour
2002	100 gigabytes per second
2007	2,000 gigabytes per second
2012	12,000 gigabytes per second
2017	35,000 gigabytes per second

Said another way: IP traffic jumped more than fivefold in the last five years and is expected to keep ramping up at a 23% compound annual growth rate to 2017. Hopefully your plans account for this dramatic growth. If they do not then aggressive planning is needed now.

In the early days, network growth occurred slowly over time. An install order was initiated and sent to every one of the affected switches in the network where engineers had to order equipment, install it, wire it and prepare for a simultaneous cutover of the new circuit. This may have taken several months.

With the advent of IP networks, voice, video and other data sessions are combined over one transport. The Internet, multimedia and smart devices continue to drive up data usage per user at an alarming pace. Network Providers due to the lack of network visibility and programmable control; address this rapid data growth by over-capacity planning. This has resulted in a huge financial burden to CSP's exponentially increasing CAPEX and OPEX.

Cirries collected data from an actual Tier-1 network consisting of 1500+ world-wide routers and demonstrated network visualization and associated network "dashboard". Using NetFlow data records, several thousand alarms were discovered that the network operator was ignoring because there was too many low level alarms masking the urgent ones. It was also discovered that one customer was using 56.4% of all the traffic on the network and was being charged the same as everyone else.

This results in tremendous CAPEX and OPEX expenditures that are not accompanied by revenue growth since the data growth is from the existing end users.

The Solution

In order to resolve this, network providers have to be able to make their network much more efficient, implement network wide visualization methods and use Big Data to analyze usage and trends to accurately and proactively predict demand. Implementing a two-pronged approach of making the network more efficient and sharing the costs with over-the-top service providers will result in positive margins.

Step by Step

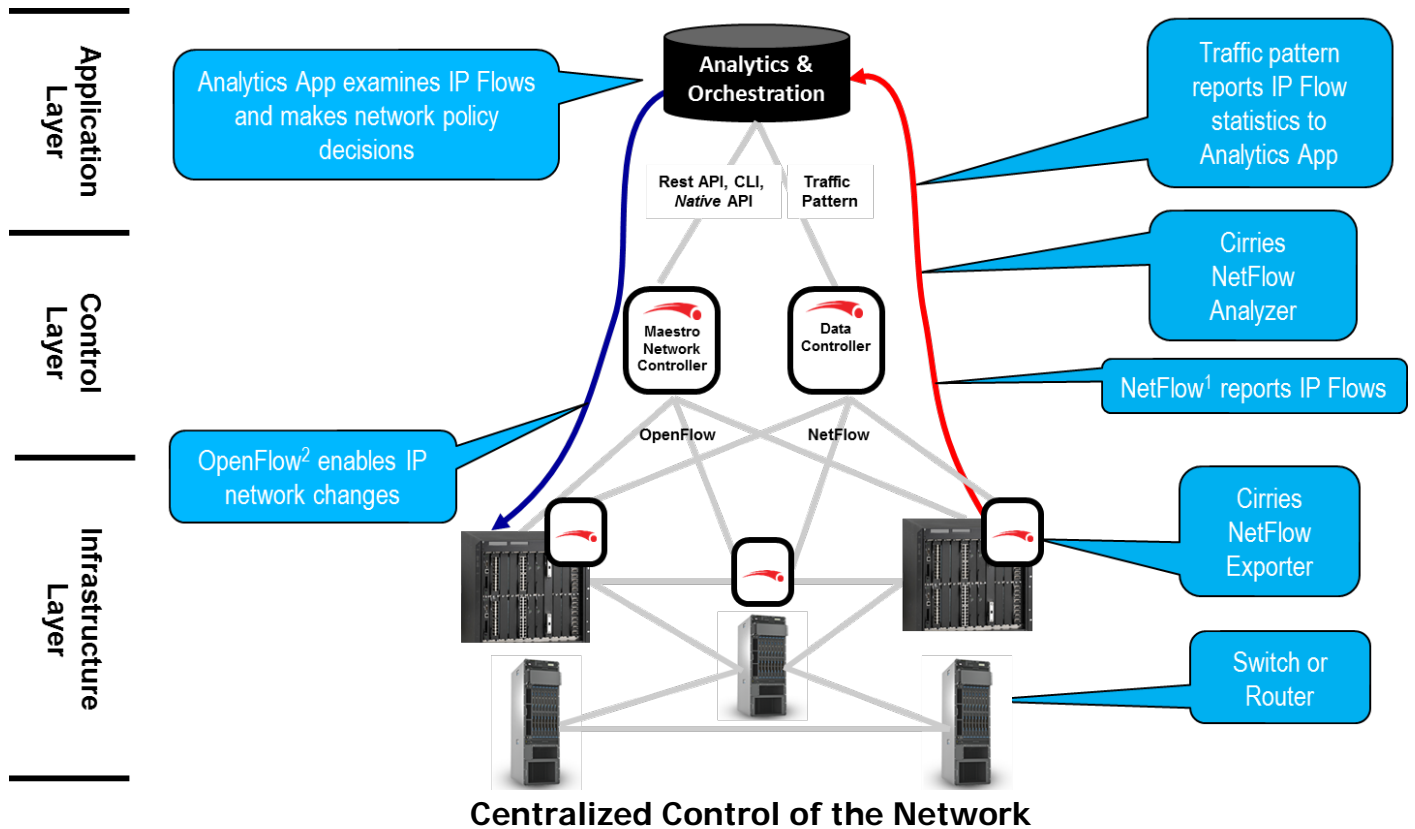
1. Deploy a robust system for collecting, aggregating and parsing currently untapped real-time network and other data throughout the wide-area network
2. Implement a total network visualization platform that utilizes the collected, real-time data engine
3. Manage network operation by implementing scripts, identifying and resolving issues quickly
4. Adjust your network elements to increase network efficiency
5. Analyze trends and plan for efficient growth
6. Automate network changes using policies that constantly evaluate and adapt the network to requirements. (gradually implement SDN)

7. Implement a pool of network elements that can be placed in and out of the network where and when needed.
8. Continuously evaluate and hone your network policies to increase efficiency
9. Implement a charging policy based on usage. Once customers are made aware of the data, they will be receptive to user-pay charges.

How do you do it?

- SDN provides the architecture to centralize network intelligence
- OpenFlow is the protocol that enables centralized network OA&M and control of network routers and routing schemes
- NetFlow is the protocol that enables reporting of end-to-end IP flows
- Combining NetFlow and OpenFlow with policy-driven analytics applications provides centralized, automated network management

Enable analytics using OpenFlow and NetFlow



¹ Other network information and streams, including Syslog, IPFLIX, SNMP could be utilized

² OpenFlow, CLI, PCEP, NETCONF, YANG, etc. can be utilized to control routing/switching infrastructure

Benefits

1. Reduced OPEX by automating network monitoring and updates
2. Reduced/deferred CAPEX by more efficiently managing the capacity of the network
3. Increased customer satisfaction and reduced churn by improving QoS of the network

Netflow Exporter Characteristics

- Sniff sampled IP traffic to generate NetFlow records
- Can be configured embedded in a switch or as a standalone unit
- Support NetFlow v5 and v9
- Extensive templates to support standard and protocol variants
- Report MPLS and non-MPLS traffic
- High performance 1M+ packets per second on a single server
- Scale linearly across multiple servers

Netflow Analyzer Characteristics

- Act as a NetFlow collector for multiple NetFlow exporters
- Analyze NetFlow data against the network topology to report the traffic pattern of a specific ingress and egress router pairs
- Big Data “ready” architecture can be scaled to handle large / core network
- Equipped to handle core network traffic analysis
- Shield analytic & orchestration app from network and data complexity

Conclusion

You really can't wait...Start evolving your network now and get ahead of the data tsunami that will soon overwhelm your network and rob you of needed margins to succeed.