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# Technology Trends Shaping Credit Unions

Presented by  
David Faleski, SVP/CIO  
Coastal Credit Union



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Assets	\$3.25 B
Members	261,000
Employees	538
Branches	23
SEGs	1,700



# THE 7 Cooperative Principles

## 1 Open and Voluntary Membership

Membership in a cooperative is open to all persons who can reasonably use its services and stand willing to accept the responsibilities of membership, regardless of race, religion, gender, or economic circumstances.

## 2 Democratic Member Control

Cooperatives are democratic organizations controlled by their members, who actively participate in setting policies and making decisions.

## 3 Members' Economic Participation

Members contribute equitably to, and democratically control, the capital of their cooperative. At least part of that capital remains the common property of the cooperative.

## 4 Autonomy and Independence

Cooperatives are autonomous, self-help organizations controlled by their members, regardless of any agreements they may enter with other organizations.

## 5 Education, Training, and Information

Education and training for members, elected representatives (directors/trustees), CEOs, and employees help them effectively contribute to the development of their cooperative.

## 6 Cooperation Among Cooperatives

By working together through local, national, regional, and international structures, cooperatives improve services, bolster local economies, and deal more effectively with social and community needs.

## 7 Concern for Community

Cooperatives work for the sustainable development of their communities through policies supported by the membership.



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People helping People



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Human Beings are BOTH  
simple and complex!

(0 or 1)

Jumbo Shrimp and other Oxymorons.

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## 19 Great Inventions That Revolutionized History

According to Interesting Engineering



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## 11. Electric Battery (1800)

Volta's Remarkable Feat

## 12. Computer (1822)

The First Mechanical Computer by Babbage

## 14. Telegraph (1830-1840)

The Communication Device that Introduced the Morse Code



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## 18. Transistors (1947)

The Secret of Modern Day Computing

## 19. ARPANET (1969)

The Primitive Internet



20.



**Why are algorithms that were basically invented in the 1950s through the 1980s only now causing such a transformation of business and society?**

**"Now, what used to be thought of as supercomputers are inside smartphones. They cost a million times less, are a million times faster and have a million times as much memory."**

-Richard Mark Soley, Ph.D., executive director, Industrial Internet Consortium

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# Raw Compute Power is Expanding Exponentially

# 1,000x

(actually  $2^{10}$  or 1,024)

Overall, how satisfied were you with ...

Extremely  
dissatisfied

Somewhat  
dissatisfied

Neither  
satisfied nor  
dissatisfied

Somewhat  
satisfied

Extremely  
satisfied





# The ALPHABET SOUP of IT





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# BI & Big Data

## Business Intelligence



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# How much data is added to the Internet every day?

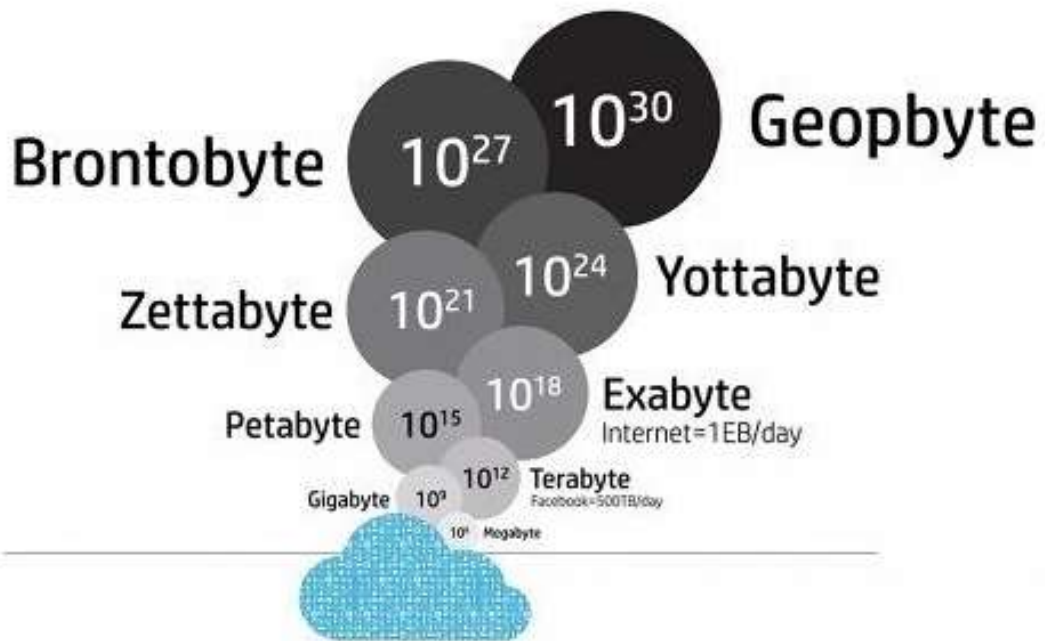
**According to Forbes**  
May 21, 2018



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There are 2.5 quintillion bytes of **data** created each **day** at our current pace, but that pace is only accelerating with the growth **of the Internet** of Things (IoT).

Over the last two years alone 90 percent **of the data in the world** was generated.



# BIG DATA versus little data

- DB Architecture
  - STRUCTURED
    - Hierarchical
    - Relational
  - UNSTRUCTURE
    - Data Lake



## Business Intelligence vs Big Data

### #1. Purpose

#### Business Intelligence



The purpose of Business Intelligence is to help the business to make better decisions. Business Intelligence helps in delivering accurate reports by extracting information directly from the data source.

#### Big Data



The main purpose of Big Data is to capture, process, and analyze the data, both structured and unstructured to improve customer outcomes.



## #3. Tools

### Business Intelligence



Below is the list of tools used for business intelligence. These tools enable business to collate, analyze and visualize data, which can be used in making better business decisions and to come up with good strategic plans.

- Tableau
- Qlik Sense
- Online analytical processing (OLAP)
- Sisense
- Data Warehousing
- Digital Dashboards and Data mining
- Microsoft Power BI
- Google Analytics etc

### Big Data



Below is the list of tools used in Big Data. These tools or frameworks store large amount of data and process them to get the insights from data to make good decisions for business.

- Hadoop
- Spark
- Hive
- Polybase
- Presto
- Cassandra
- Plotly
- Cloudera
- Storm etc



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# CC

## Cloud Computing

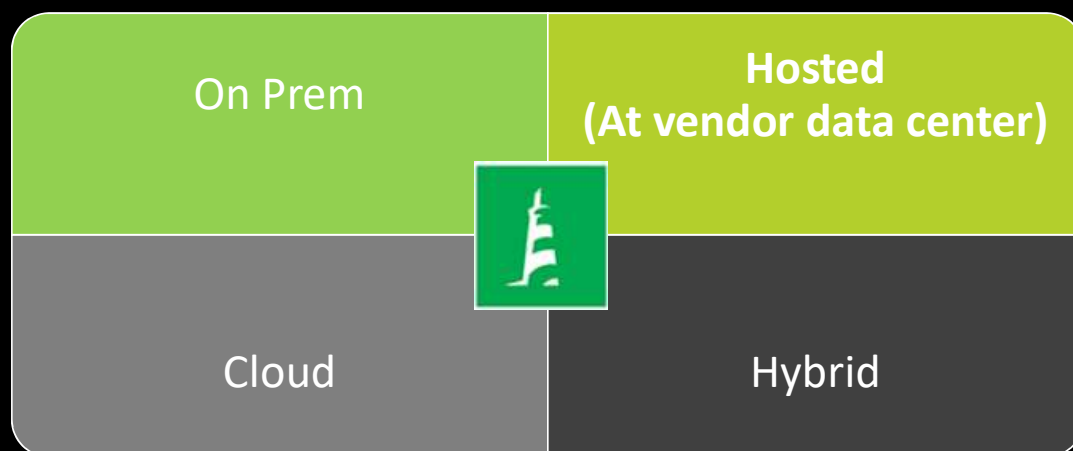




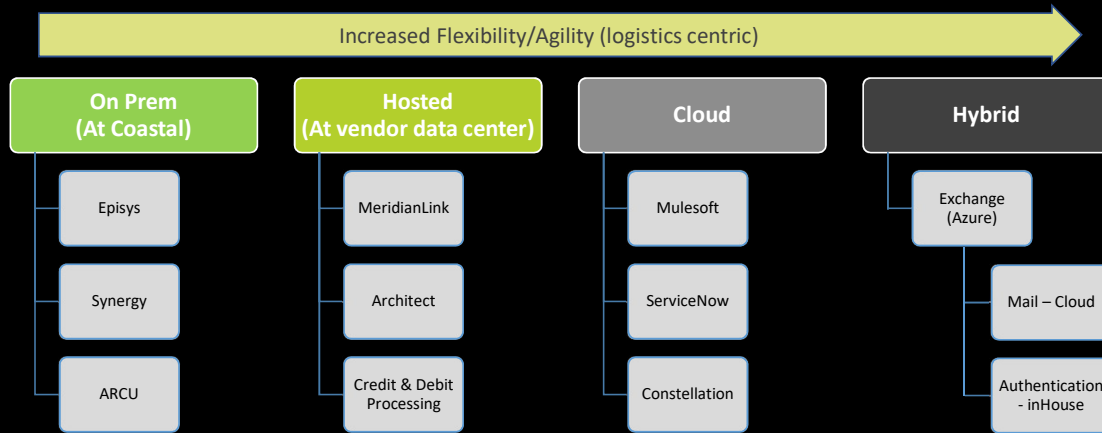
## What is Cloud Technology?

- Provides the means through which everything from computing power to business processes to personal collaboration is delivered as a service wherever and whenever you need it.
- Cloud Computing is the use of computing resources (hardware and software) that are delivered as a service over a network.

## Networking Deployment Options



# Deployment Strategy at Coastal



Risks: Performance, Security, Complexity and Consumption Based costs.

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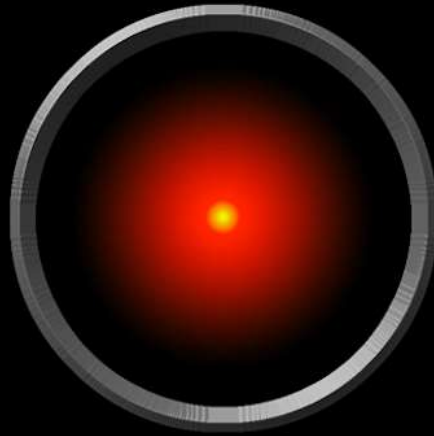
# AI

## Artificial Intelligence





I'm sorry Dave,  
I'm afraid I can't do that.



**AN ACCOUNT OF THE  
PRINCIPALITIES OF  
WALLACHIA AND MOLDAVIA  
INSPIRED THIS AUTHOR'S  
MOST FAMOUS NOVEL**



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# ML

## Machine Learning



## MACHINE LEARNING

Machine learning is a subfield of computer science that evolved from the study of pattern recognition and computational learning theory in artificial intelligence. In 1959, Arthur Samuel defined machine learning as a "Field of study that gives computers the ability to learn without being explicitly programmed".

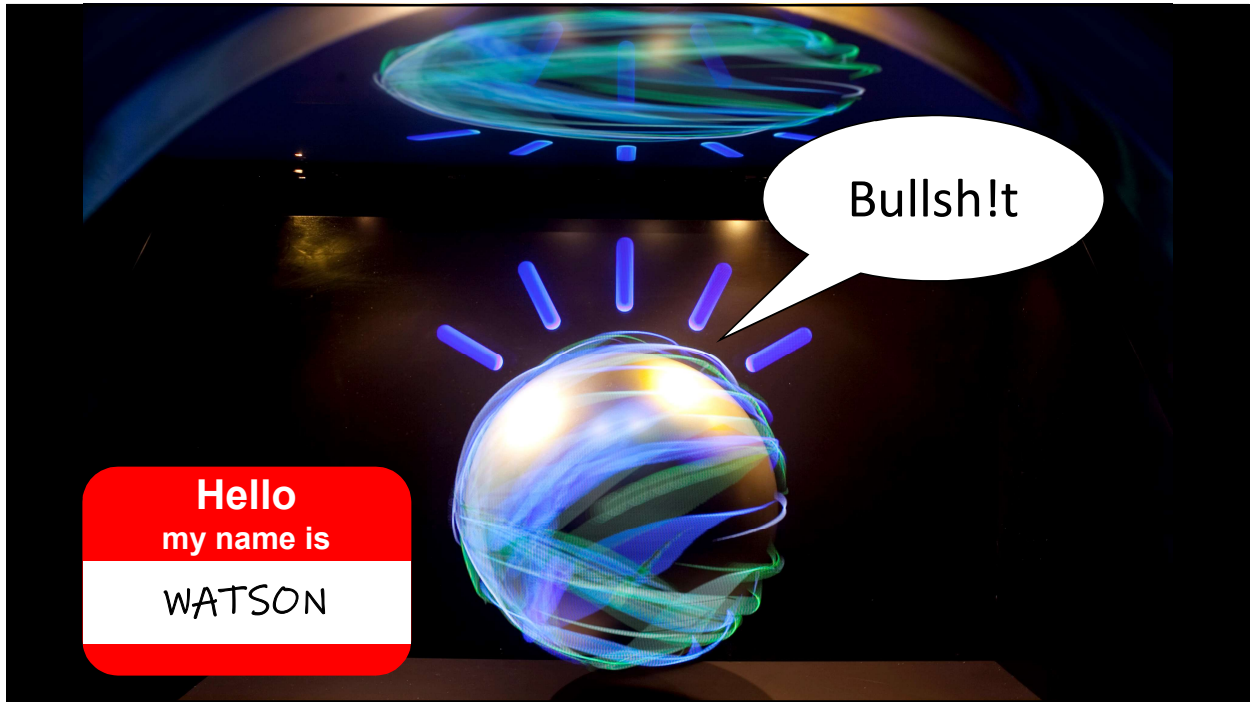



GREETINGS PROFESSOR FALKEN

HELLO


A STRANGE GAME.  
THE ONLY WINNING MOVE IS  
NOT TO PLAY.






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 **Technology**

Led by Filene Fellow Bill Maurer, the Center for Emerging Technology looks far into the future to connect credit unions with the most impactful technology and drive forward-thinking business decisions.

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# Digital Redlining

# Virtual Discrimination

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# RPA

## Robotic Process Automation



# Efficiency Ratio

$$\frac{\text{Operating Expenses}}{\text{Net + Non Interest Income}}$$



(excluding interest expense)

# Efficiency Ratio

$$\frac{\$6,640,036}{\$8,598,004}$$



(excluding interest expense)



# Efficiency Ratio

	<u>\$ 6,640,036</u>	<u>\$ 6,640,036</u>	<u>\$ 6,448,503</u>	
<b>\$ 255,377-</b>	\$ 8,853,381	\$ 8,598,004	\$ 8,598,004	<b>\$ 191,533-</b>
	75%	77%	75%	



**EFFICIENCY IS DOING  
BETTER WHAT IS  
ALREADY BEING DONE**

PETER DRUCKER

PICTUREQUOTES.COM



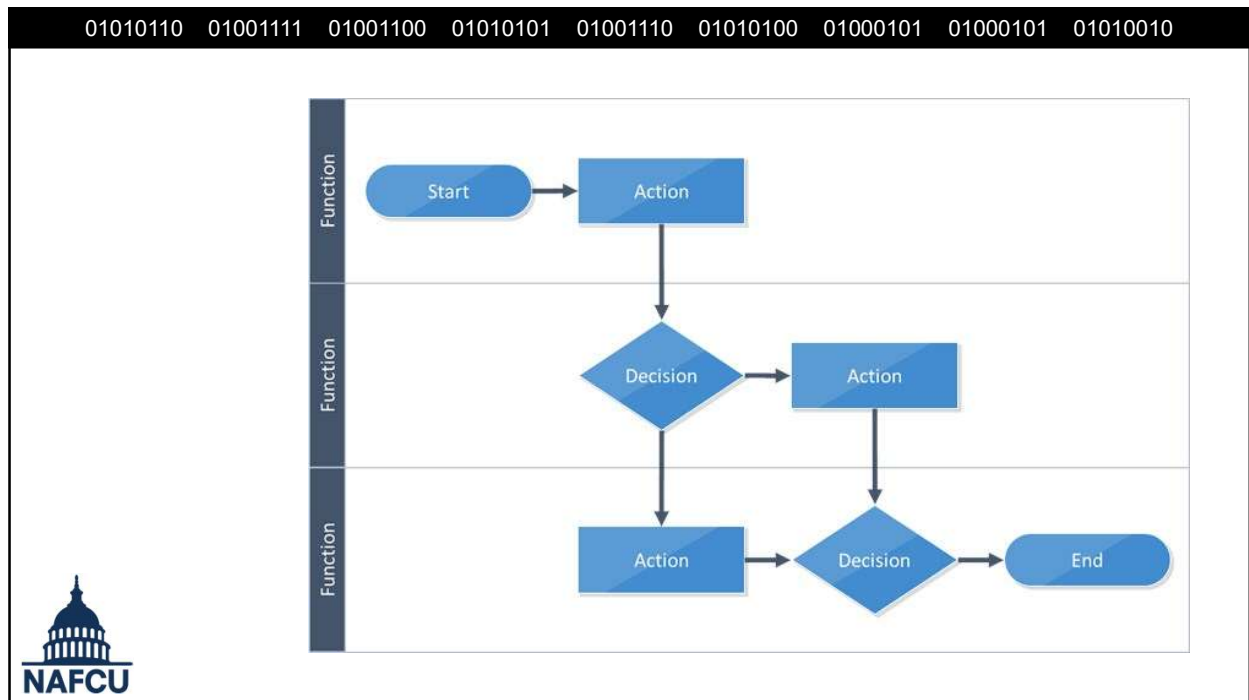
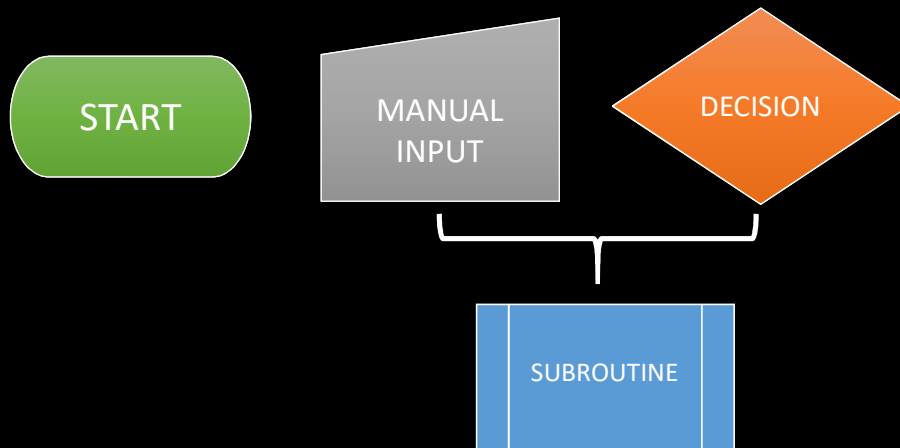
“These aren’t the BOTS you’re looking for...”



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THROUGHPUT

# RPA & the Shapes of Things to Come!



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LoBOTomized!

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APIs **& ESB**

Application Programming Interface





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VS



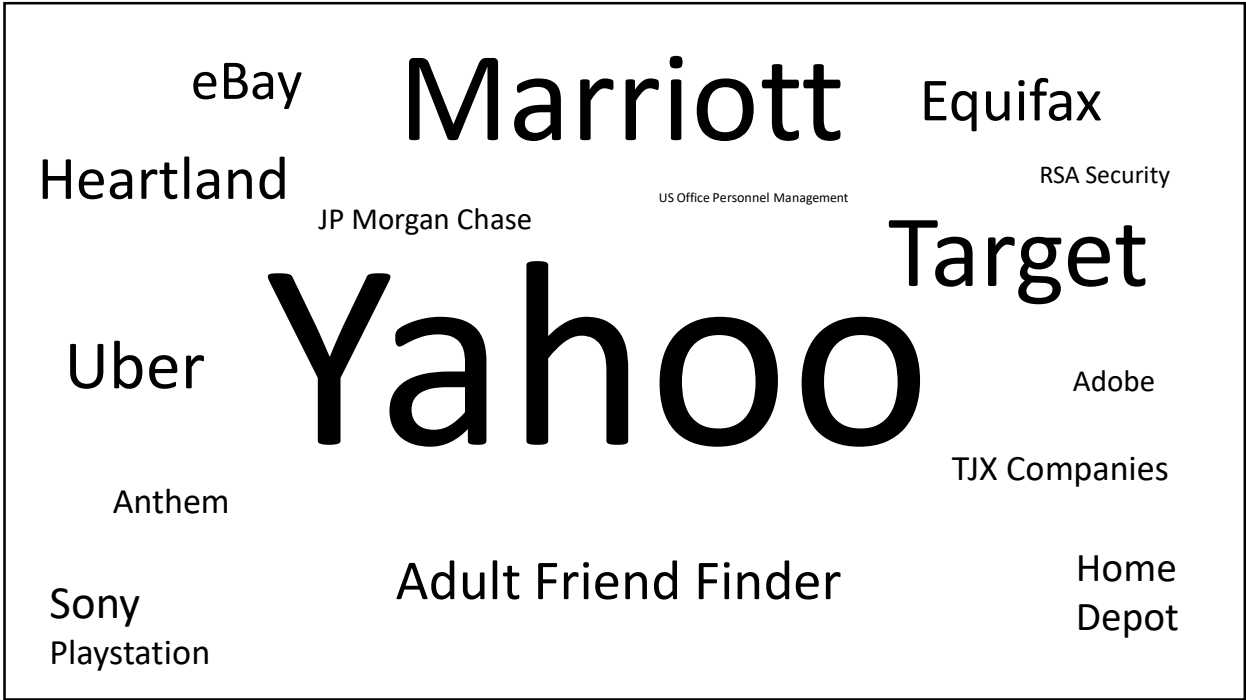
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# FFIEC / ACET

& NIST and ITIL

## IT SECURITY







**Firestone**



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Cyber-Safe

# A smart fish tank left a casino vulnerable to hackers

by Selena Larson @selenalarson

🕒 July 19, 2017: 7:00 PM ET

👍 Recommend 12 📺 📧 🌐 📱



Most people know about phishing -- but one casino recently learned about the dangers of actual fish tanks.

Hackers attempted to steal data from a North American casino through a fish tank connected to the internet, according to a report from security firm [Darktrace](#).



# BAD ROBOT

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# 5G

5<sup>th</sup> Generation



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Gigabit Speeds  
Sub-millisecond Latency

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4G

15 Mbps @ 50ms

5G

50 Mbps @ 10ms

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# Q

## Quantum computing



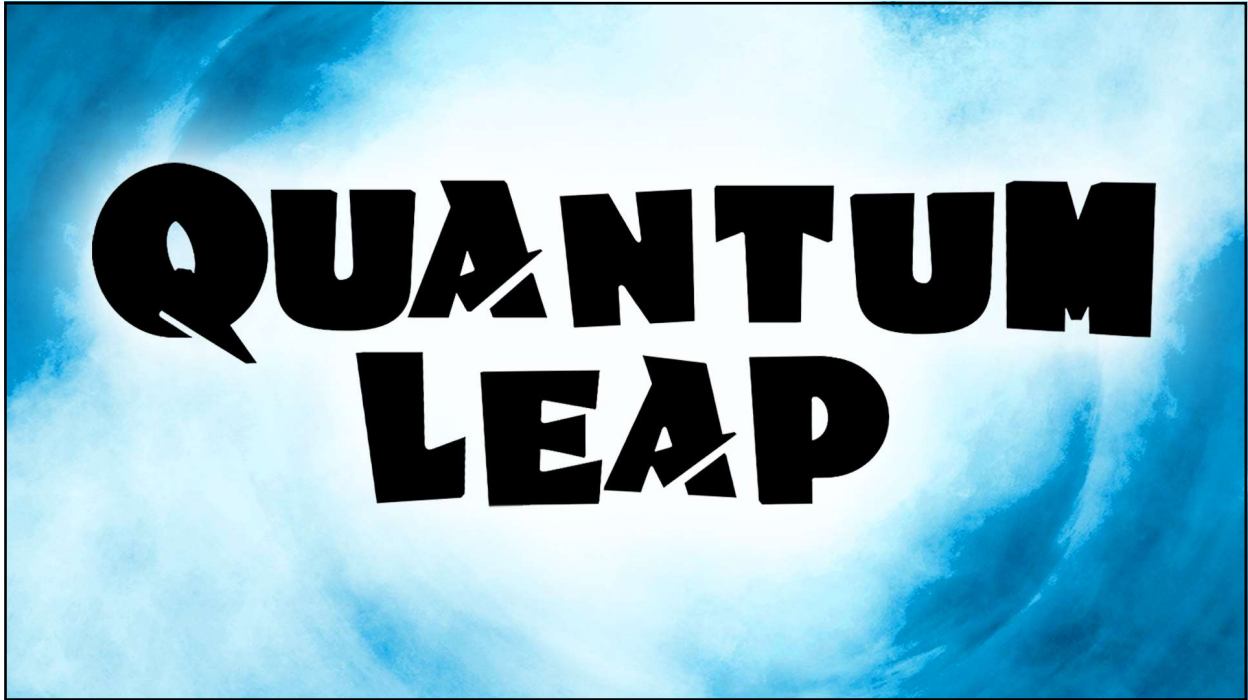
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Computers will be BOTH simple  
and complex!

0 AND 1?



We are not there yet, but...





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### THE SERVICE PROVIDERS



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# CONSTELLATION



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**Thank you for your time,  
your attention, and  
your commitment  
to keeping our industry great!**

