The Evolution of the Data Center Sector

Challenges and Opportunities in a Digital World

David Hughes RCDD/DCDC/NTS

Vice President Field Application Engineering EMEA

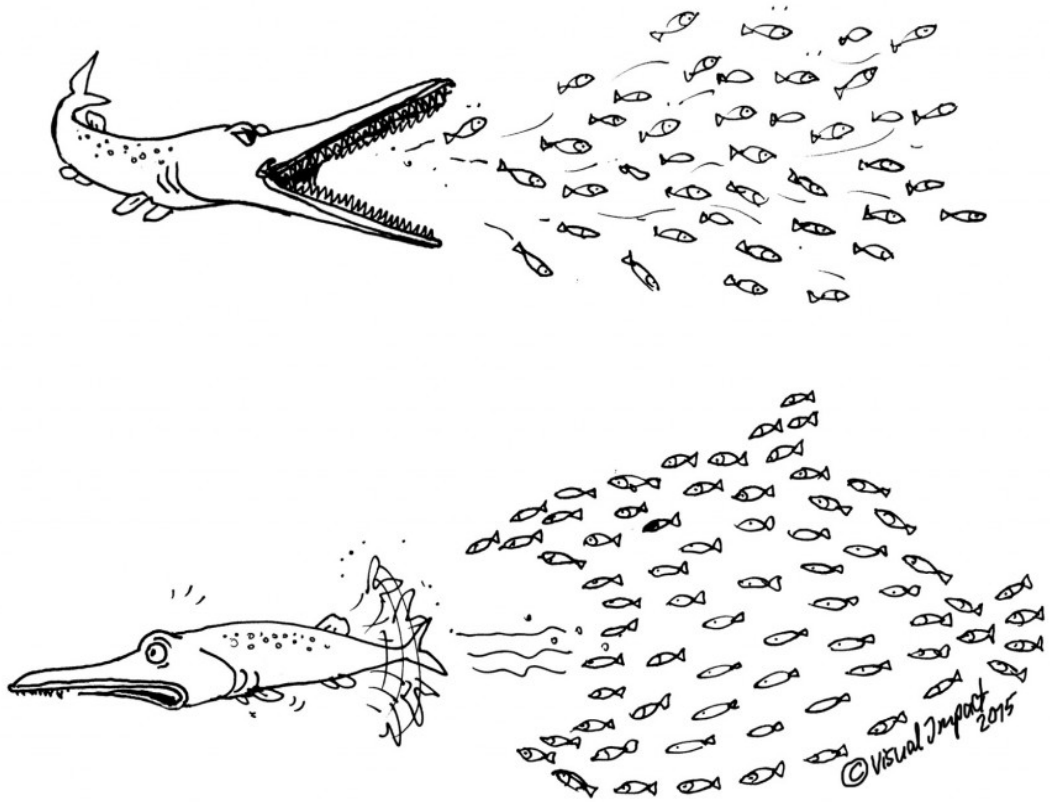
COMMSCOPE®

BICSI

Food for Thought

"It is not the strongest of the species that survives, nor the most intelligent…it is the one that is the most adaptable to change"

Charles Darwin



Are we Underestimating the Pace of Change?

Technology Tipping Points

(Courtesy of The World Economic Forum 2016)

2018 2021 2027

Shift 9: The Connected Home

Tipping point: Over 50% of internet traffic delivered to homes for appliances and devices (not for entertainment or communication)
Expected date: 2024
By 2025: 70% of respondents expected this tipping point to have occurred

In the 20th century, most of the energy going into a home was for direct personal consumption (lighting). But over time, the amount of energy used for this and other needs was eclipsed by much more complex devices, from toasters and dishwashers to televisions and air conditioners.

The internet is going the same way: most internet traffic to homes is currently for personal consumption, in communication or entertainment. Moreover, very fast changes are already occurring in home automation, enabling people to control lights, shades, ventilation, air conditioning, audio and video, security systems and home appliances. Additional support is provided by connected robots for all kinds of services – as, for example, vacuum cleaning.

Shift 10: Smart Cities

Tipping point: The first city with more than 50,000 inhabitants and no traffic lights
Expected date: 2026
By 2025: 64% of respondents expected this tipping point to have occurred

Many cities will connect services, utilities and roads to the internet. These smart cities will manage their energy, material flows, logistics and traffic. Progressive cities, such as Singapore and Barcelona, are already implementing many new data-driven services, including intelligent parking solutions, smart trash collection and intelligent lighting. Smart cities are continuously extending their network of sensor technology and working on their data platforms, which will be the core for connecting the different technology projects and adding future services based on data analytics and predictive modelling.

Tipping Point is described as ‘moments when specific technological shifts hit mainstream society’

BICSI

Why this sudden progress in the Second Machine Age?

1994 - ASCI Red Supercomputer

$55M – 1 Teraflop Speed

2013 – Playstation 4

100,000 x less cost – ~2 Teraflop Speed

Exponential improvement in Computational Power

Source: Brynjolfsson, E. and McAfee, A., 2014. *The Second Machine Age*.

What about Storage?

1956 IBM RAMAC HDD – 1 TON/5MB

Exponential improvement in Size, Speed and Capacity

Source: IBM.

A Roadmap exists…….
but the path is anything but straight

Ethernet speed

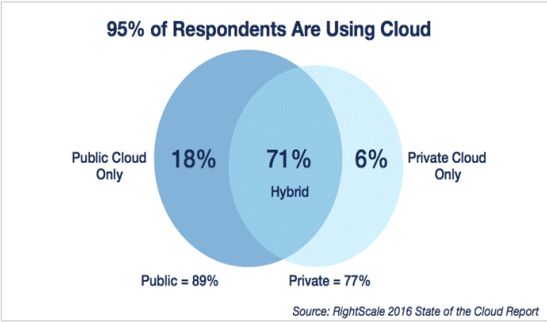
Speed in development

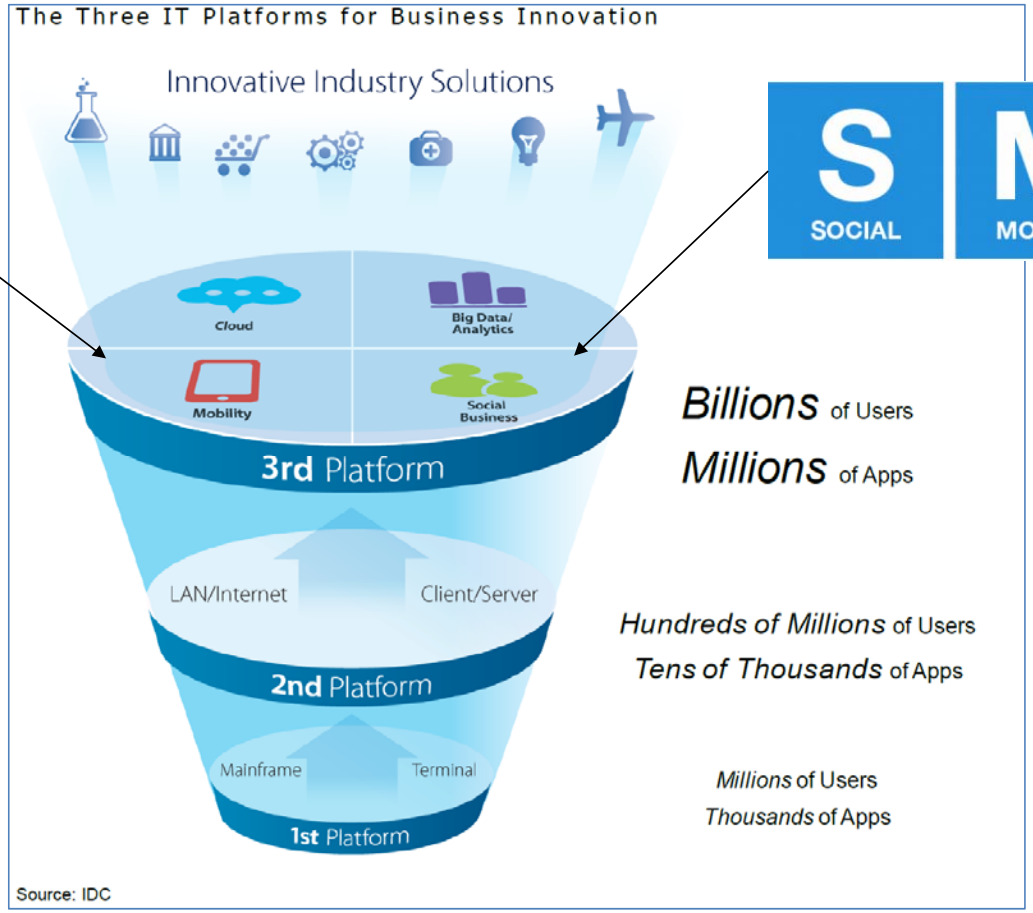
Possible future speed

BICSI

Data Centre Evolution

Fundamental to Digital Transformation
-Public Cloud
-Private Cloud
-Hyperscale





The 4 Pillars:

S SOCIAL | M MOBILE | A ANALYTICS | C CLOUD

Now

1990s

1960s

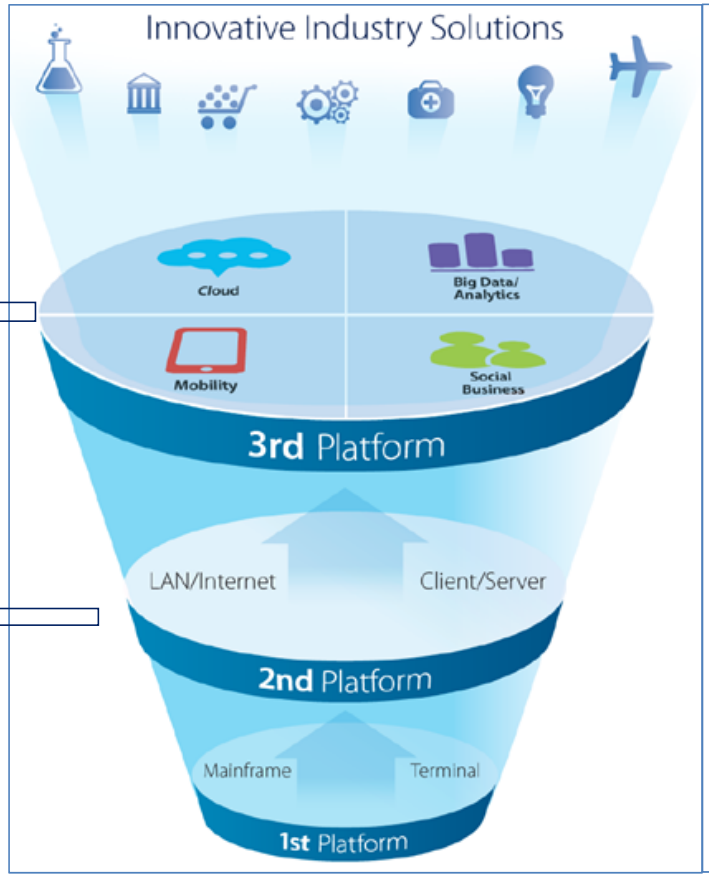
Bicsi

Digital Transformation Requires Data Centre Transformation

SMAC-optimized Enterprise Data Centre

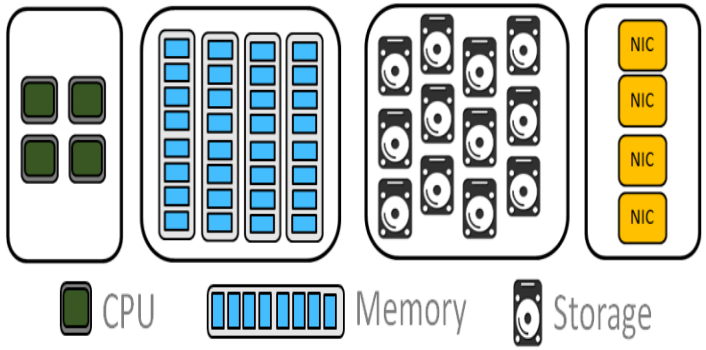
- **Agile**
- **Scalable**
- **Automated / Software controlled**
- **Bandwidth optimized**
- **Hyperconverged**

Traditional Enterprise Data Centre



SMAC optimised data centres will be **Software Defined Data Centres (SDDC)** by adopting modern Cloud / HyperScale approaches using architectures and technologies such as:

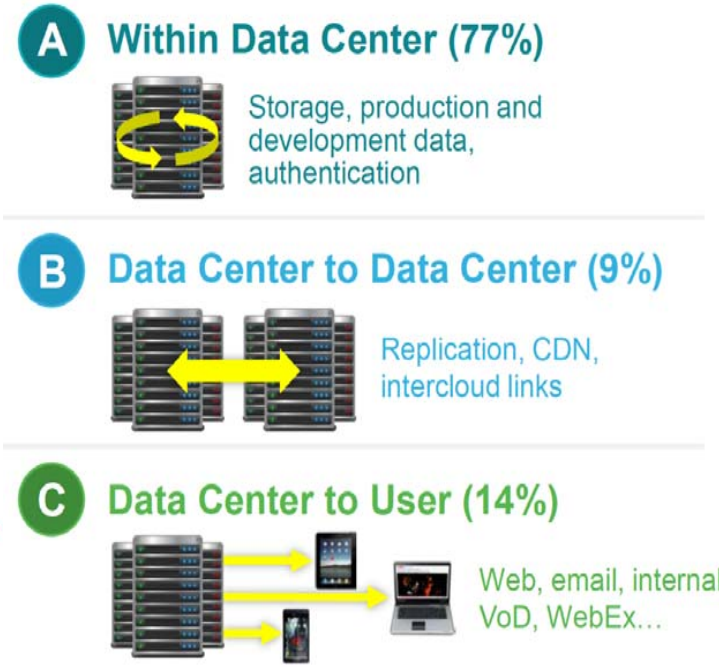
- Automation & SDN
- Hyperconvergence
- 2-tier Switching Architectures

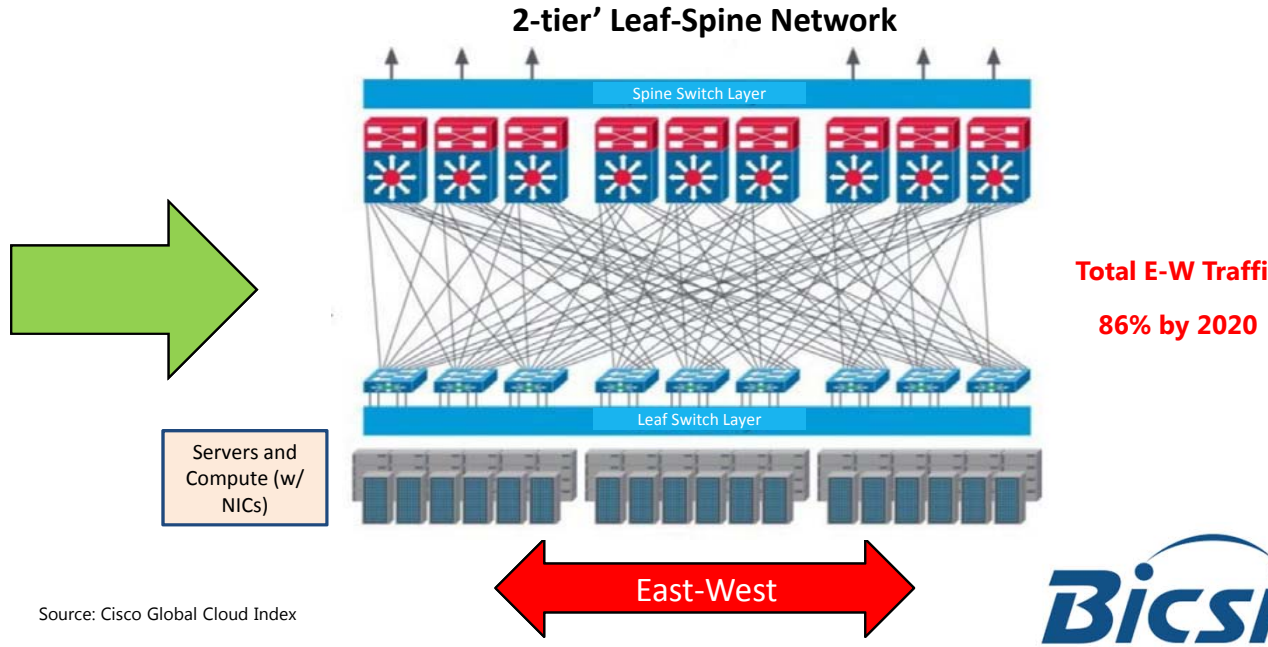


BICSI

Hyperscale Architectures adapted for Enterprise Data Centers

- Historically Enterprise has been a 3-tier topology – aggregation and blocking architecture
- Cloud data center networks are 2-tier topology
  - Optimized for East-West traffic
  - Workloads spread across 10s, 100s, sometimes 1000s of VMs and hosts
  - Higher degree (10-20X) of east-west traffic across network (server to server)





Source: Cisco Global Cloud Index

Impact of SDN and Spine-Leaf on Traffic

Software and Automation are key elements of the Data Centre space

Higher Bandwidth and Latency Sensitive Applications

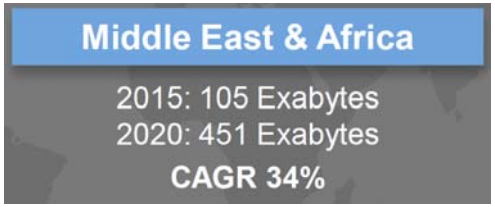
- HD Cameras / Security
- Visual Recognition
- Analytics

Everything goes back to the Data Centre

Big Data. Traffic engineering supports “elephant” data flows without compromising “mouse” data flows.

Video Bitrates. SDN will allow video bitrates to increase, because SDN can seek out highest bandwidth mid-stream.

Cloud Gaming. SDN can decrease latency, allowing cloud gaming applications to decrease delay by up 10%.



Global Data Centre Traffic

Source: Cisco Global Cloud Index

The Relevance of the Data Center

‘FOBO’

The ‘FEAR OF BEING OFFLINE’

Essential for Gaining and Sustaining Competitive Advantage

What does Technology Disruption mean to the ICT Industry?

- Technology is rapidly evolving
- The Competitive Landscape is Changing
- Customer Business Models
- Engagement Strategies
- Roles are being re-defined
- Skills and Capabilities

Ongoing Initiatives…..

- Skills ‘Crisis’ is a Challenge but also presents an Opportunity
- Organizations across the globe are Evolving
- STEM subjects must be introduced earlier – and to a broader audience
- Learning (and Teaching) has never been more critical

Internships Bring Learning, Experience and Fun

Darshan Joshi August 31, 2017

This is the first in a series of posts from CommScope interns. The series will share experiences and learnings from students as they apply classroom learnings to real-world challenges in the workplace.

I came to the University of Maryland as a Graduate student in the Fall of 2016 deciding to spend my first American winter on campus. The university felt nearly empty, not unlike a ghost town. On a quest for warmth and motivation I began researching and applying for summer internships in the field of wireless communication/RF as I had recently completed my first semester in the Master's in Telecommunications (ENTS) program. On a Tuesday morning in January, I received a call from Mark Valadez, a recruiter at CommScope; it still gives me great joy to go back and reread his first email as it was one of those triggers of hope that paved way for the opportunity that followed.

University Technical Colleges®

INSTITUTE FOR APPRENTICESHIPS

plug the skills gap in power management and other key technical areas. CNet Training's Dr Terri Simpkin looks at the underlying issues and warns that 'skills wastage' is a major problem.

incidents that have raised public awareness of the centrality of mission critical infrastructure. While most people outside of the sector have little understanding of what a data centre actually is or how it underpins much of their day-to-day activity, when something goes horribly wrong the focus is squarely on the importance of 'keeping the lights on'.

This is not just confined to Technical Skills

Bicsi

The 10 skills you need to thrive in the Fourth Industrial Revolution

- Problem Solving, Critical Thinking and Creativity
- Emotional Intelligence
- Collaboration and articulating technical acumen
- Being credible and adding business value

Top 10 skills

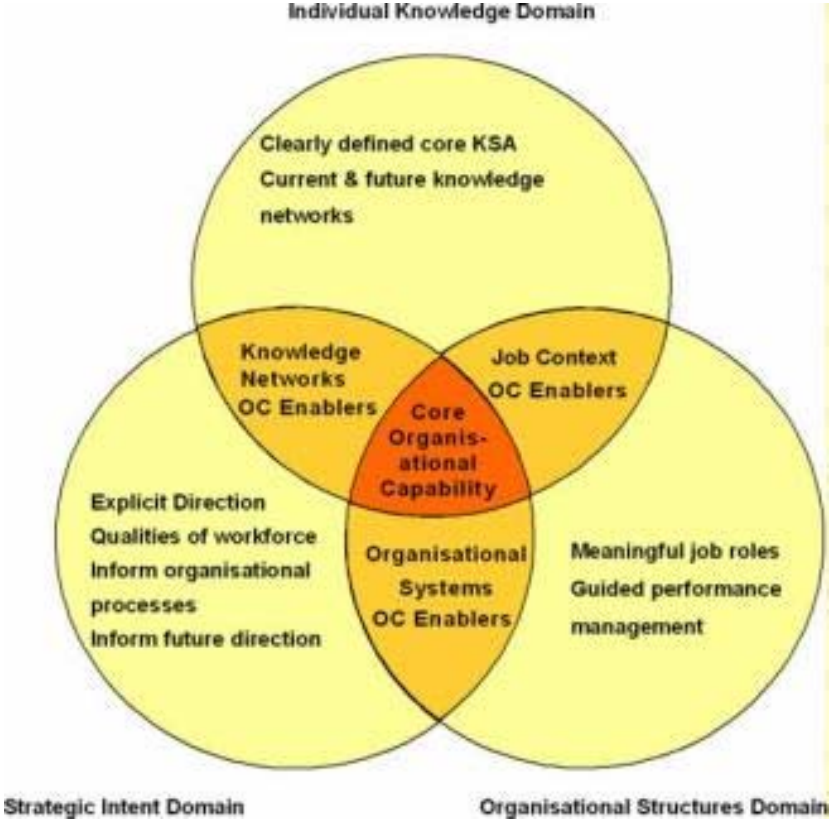
in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity

Source: Future of Jobs Report, World Economic Forum

Bicsi

Developing Knowledge, Skills and Abilities (KSA)

- Synergy and Alignment
- Developing KSA for Future Knowledge Networks
- Structured and Enabled effectively
- Aligned with the Strategic Direction of the Company
- Understand the External Environment – Continuous Assessment



Source: Gill and Delahaye.

Creating a Personal Strategy for Success

YOU hold the key to your own success

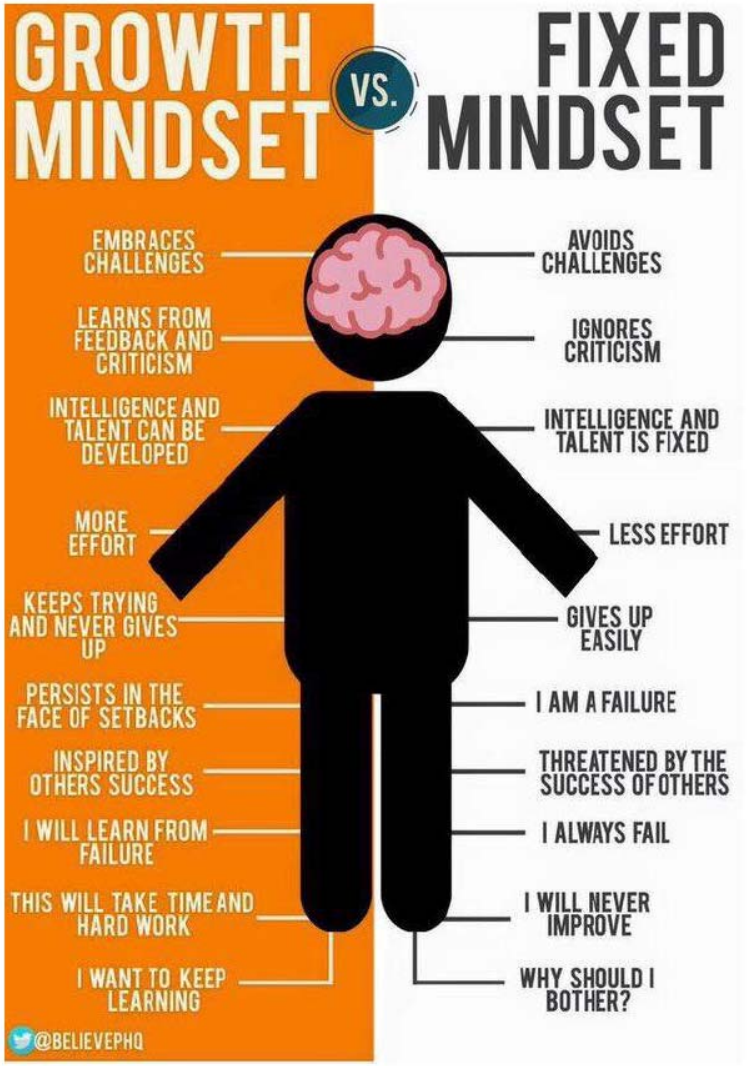
Adopt a Growth Mindset

Embrace Change – Embrace Learning

Never be afraid to ask

Map out where you want to go

Make it Happen



Bicsi

Key Takeaways…

- Technology is evolving at an unprecedented Rate
- The way we interact and service our customers is changing
- Technical Skills are key – but so are our competencies and capabilities
- Continuous Improvement is critical to your career and continued business growth
- Challenge yourselves – Challenge others
- And remember…

"The Only Constant is Change"

BICSI

Thank You

and enjoy the rest of the conference

David Hughes

COMMSCOPE®

dave.hughes@commscope.com

Linkedin: https://www.linkedin.com/in/dave-hughes-46abb83/