Welcome

Jay Wilson

Senior Vice President and General Manager
Carrier Networks Division

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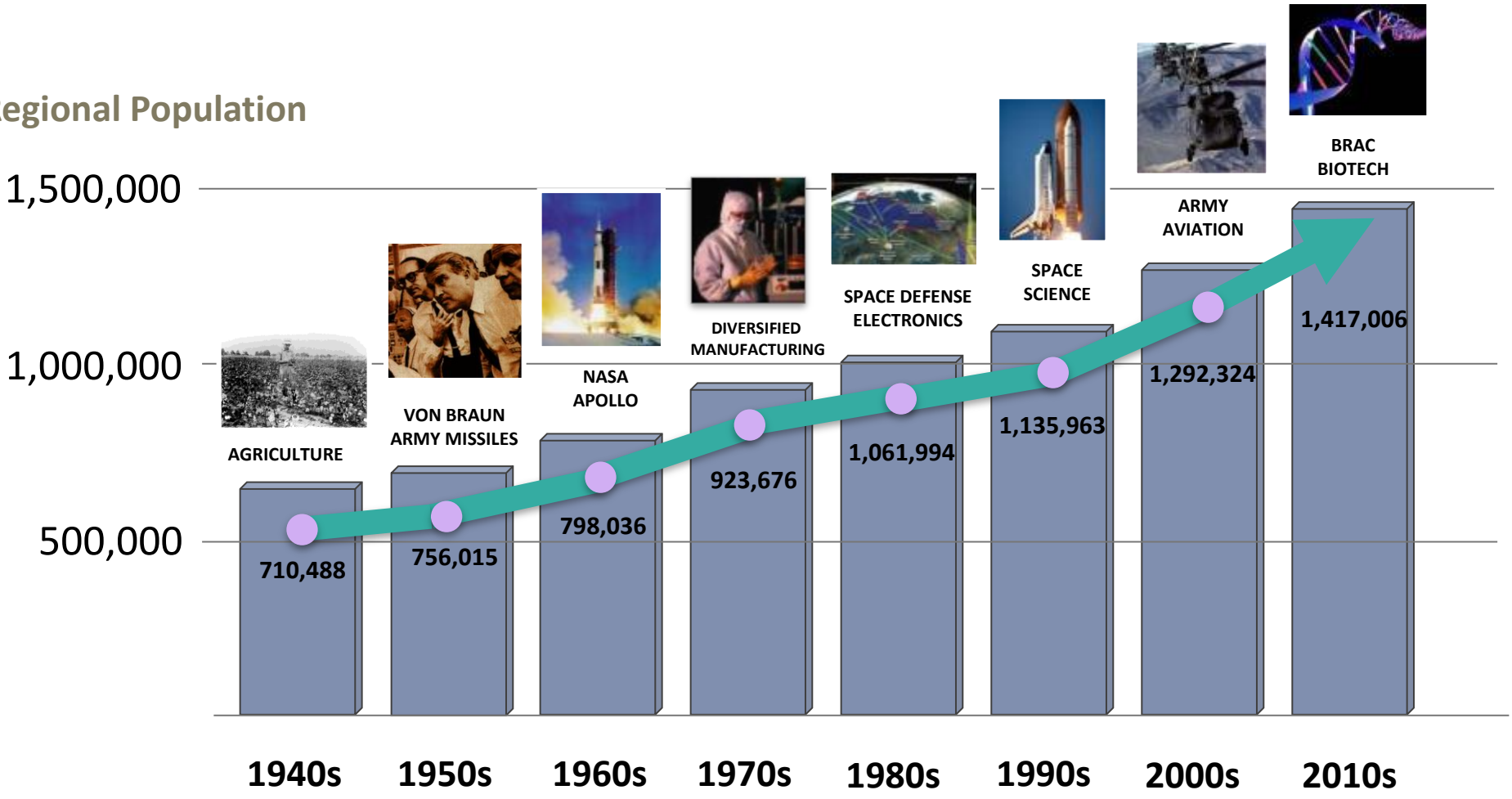
Welcome to Huntsville

History of Innovation

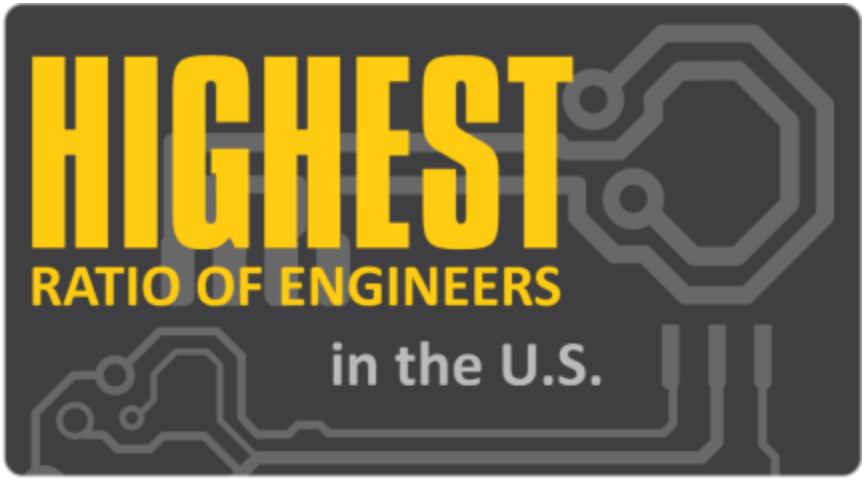
Regional Population

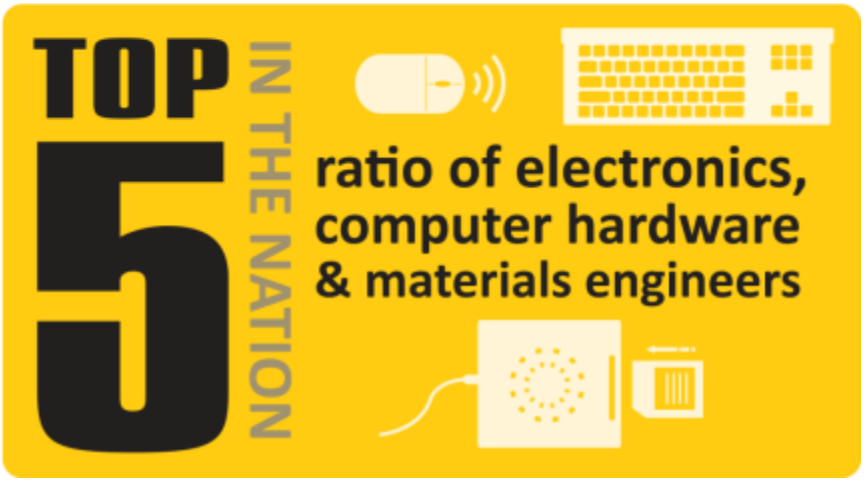


Source: U.S. Census

Leading the Way – Computer/IT

Leading the Way - Engineering





Huntsville Innovators

Dr. Wernher von Braun

Founder of America's Space Program

Huntsville Innovators

Dr. Mike Brown

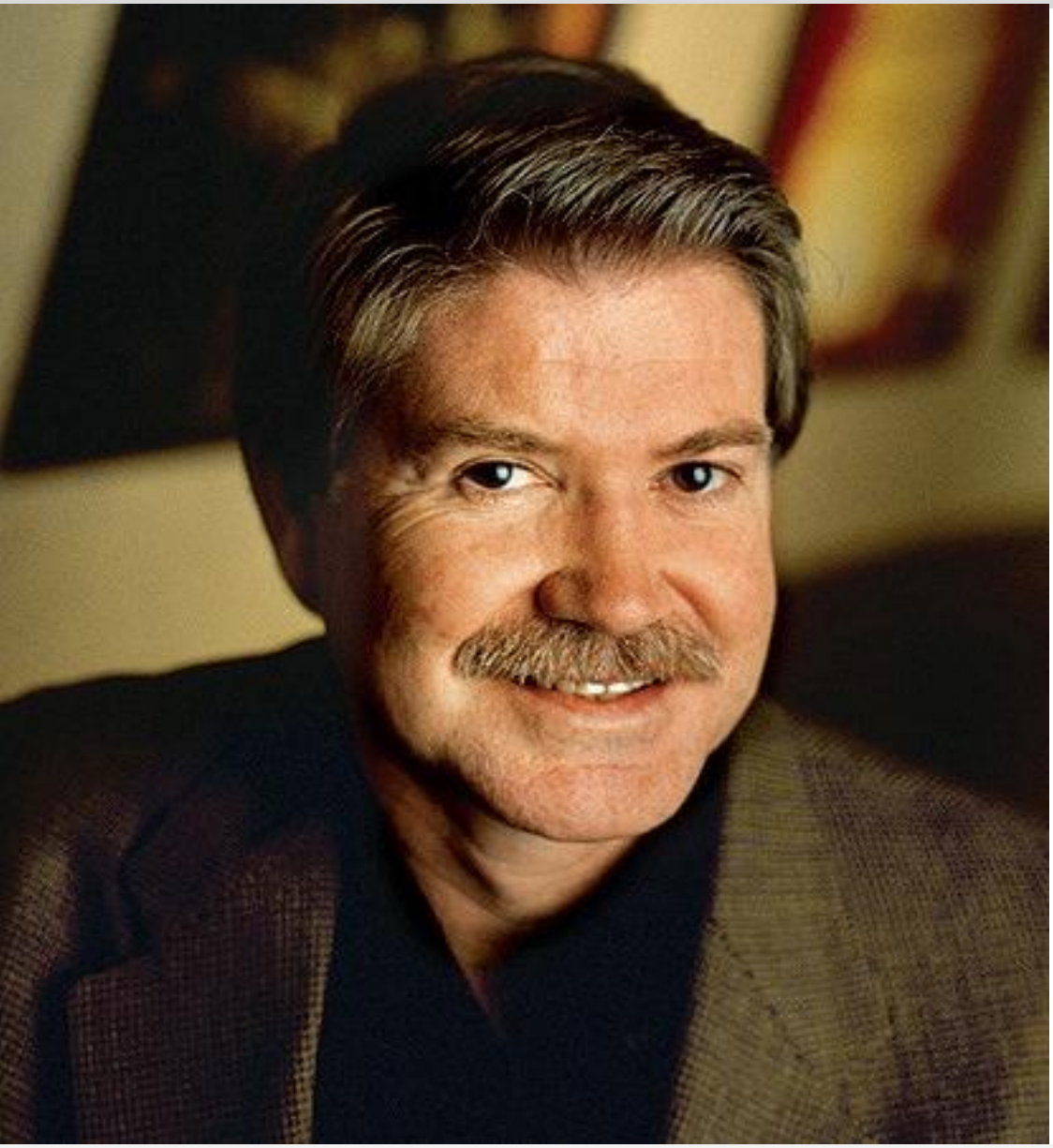
Astronomer

One of Time Magazine's Leading World Shapers

Huntsville Innovators

Jimmie Wales
Wikipedia Founder
One of Time Magazine's Leading World Shapers

Huntsville Innovators



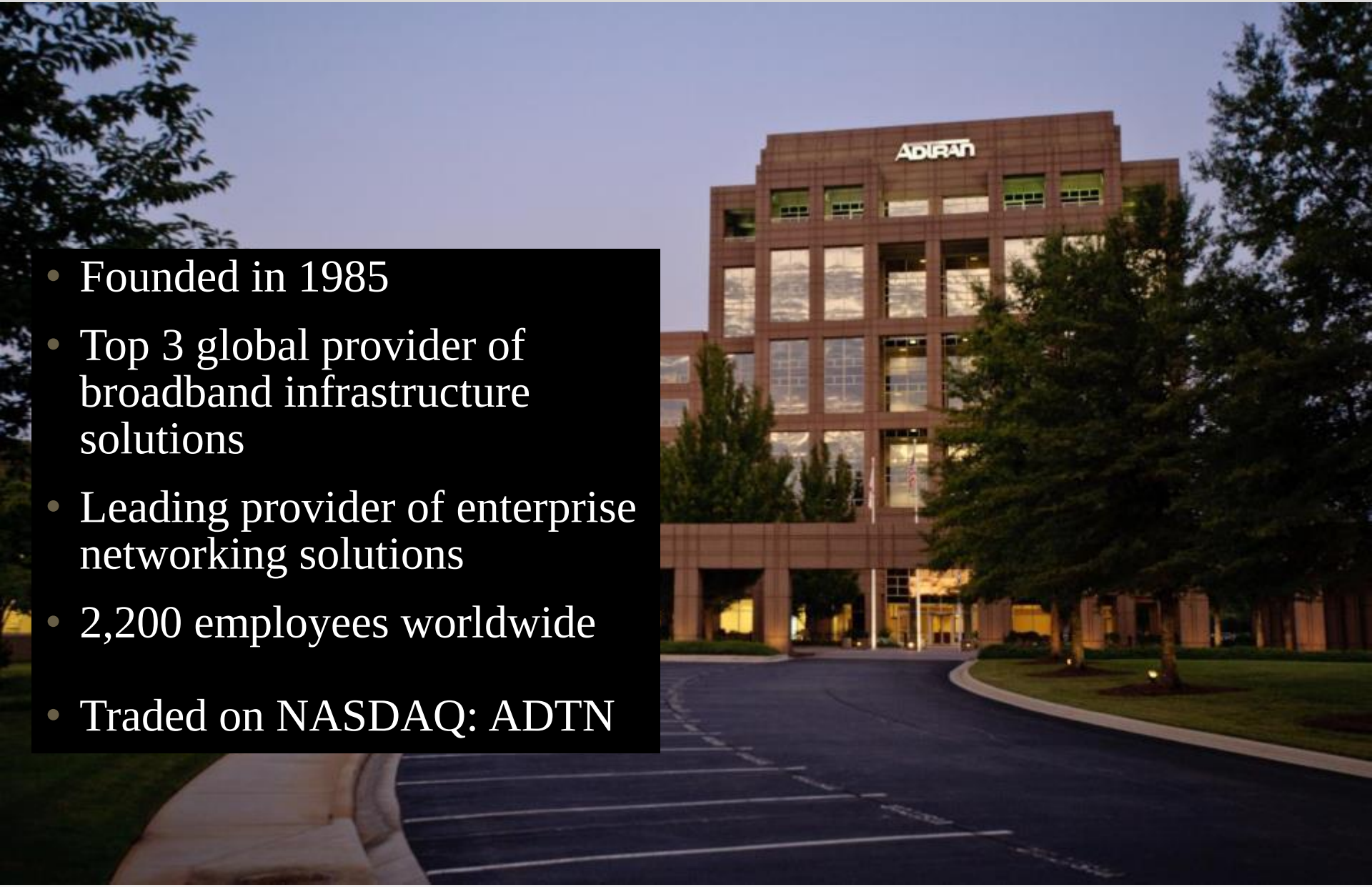
John Hendricks
Founder & CEO of the Discovery Channel

ADTRAN

Company History

For nearly three decades, ADTRAN has been advancing human progress through technology.

Key Facts



- Founded in 1985
- Top 3 global provider of broadband infrastructure solutions
- Leading provider of enterprise networking solutions
- 2,200 employees worldwide
- Traded on NASDAQ: ADTN

Market Leadership – Broadband Access

Market Leadership – Enterprise Solutions

Who We Serve

387

Service Provider Customers

68

Countries

2.2 MILLION Units Produced Each Year

Standards Participation

- Optical Access
  - FSAN (NGPON2)
  - ITU-T Q2/15 (NGPON2)
- SDN/NFV
  - ETSI NFV ISG
  - Broadband Forum
    - (virtual RG, SDAN (ADTRAN editor))
- Network Architecture
  - Broadband Forum (FTTdp network architecture)
- Network Management
  - Broadband Forum (FTTdp YANG models, management architecture)
- Copper Access
  - Broadband Forum (metallic testing and interoperability)
  - UK NICC DSL WG (ADTRAN Vice Chair)
  - ETSI TM6 (Reverse powering)
  - ATIS STEP-TEE (ADTRAN editor energy efficiency standard)
  - ATIS STEP-NPS (Line powering)
  - ITU-T Q4/15 (G.fast, ultra-short copper access)
- Wi-Fi
  - Wi-Fi Alliance
- Carrier Ethernet
  - MEF
- Other
  - TIA, IEC, IEEE TSTC

Reliability Engineering

- Highly Accelerated Life Testing (HALT) for New Products:
  - Includes testing outside of specifications including temperature extremes, thermal imaging, power cycling, cold start testing, input voltage margining
- Power Supply Vulnerability Analyses for New Products:
  - Includes wide range of testing to identify margin issues
- Component Alternate Source Evaluation:
  - Test component alternate source candidates

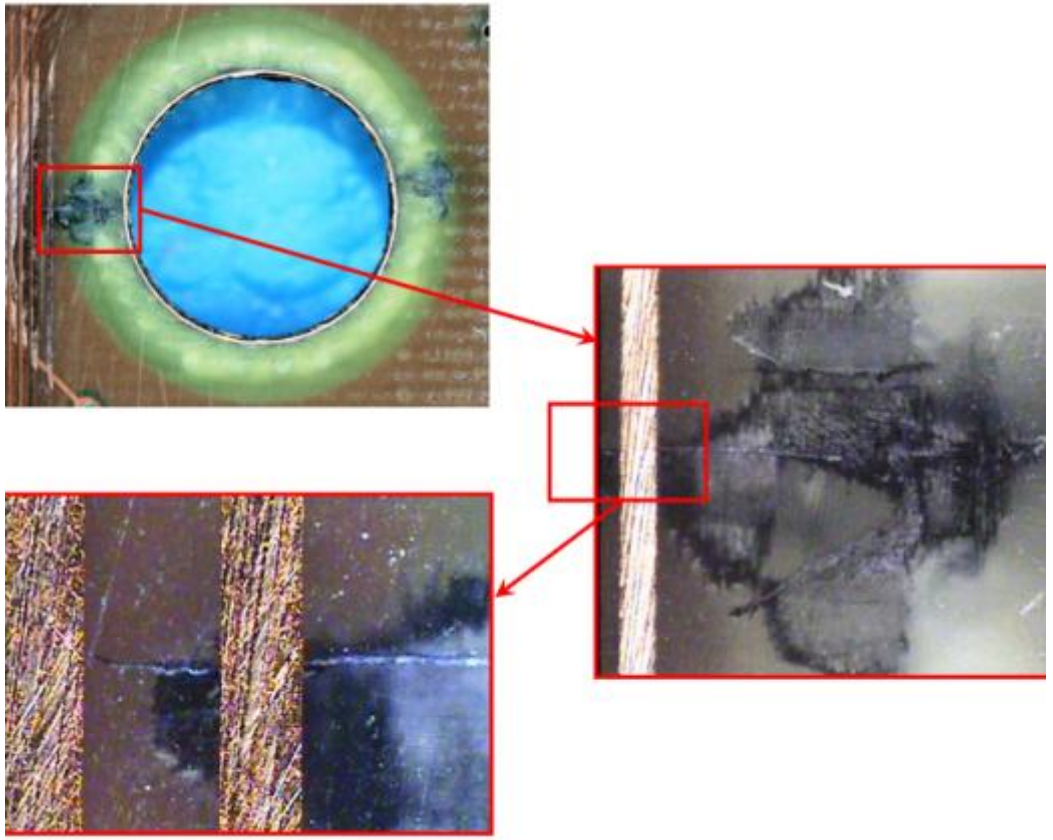
Reliability Engineering

- Ongoing Reliability Testing (ORT):
  - Long term testing (1 to 6 months) on select products in production
  - Long term elevated temperature testing (above specification)
- Product Failure Analyses:
  - Field return evaluation, especially multiple no trouble found (NTF)
  - Identify product improvement opportunities

Reliability Engineering

General New Product Engineering & Field Failure Analysis

PCB sectioning, component de-capping, optical gauging, and high-magnification photography support both in-house and field failure analysis



Independent evaluation of engineering prototypes and early production units

Compliance

- 19 Employees within the Compliance Department and 3 Independent Lab Personnel
- The Compliance Technical Staff has an Average of 17 years Compliance experience.

- A2LA ISO 17025 Accredited Labs for Domestic and International Compliance Testing.
- Two Independent Lab Personnel (UL and Intertek) stationed on site to witness NEBS, ITU and ETSI related testing.
- One Independent Lab Personnel (Intertek) stationed on site to witness NRTL Safety related testing.

Network Evolution Trends

Evolution of Communications Networks

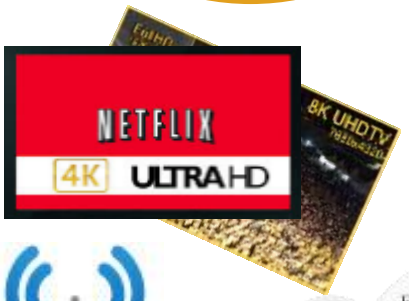
High-bandwidth, cloud-centric apps

+

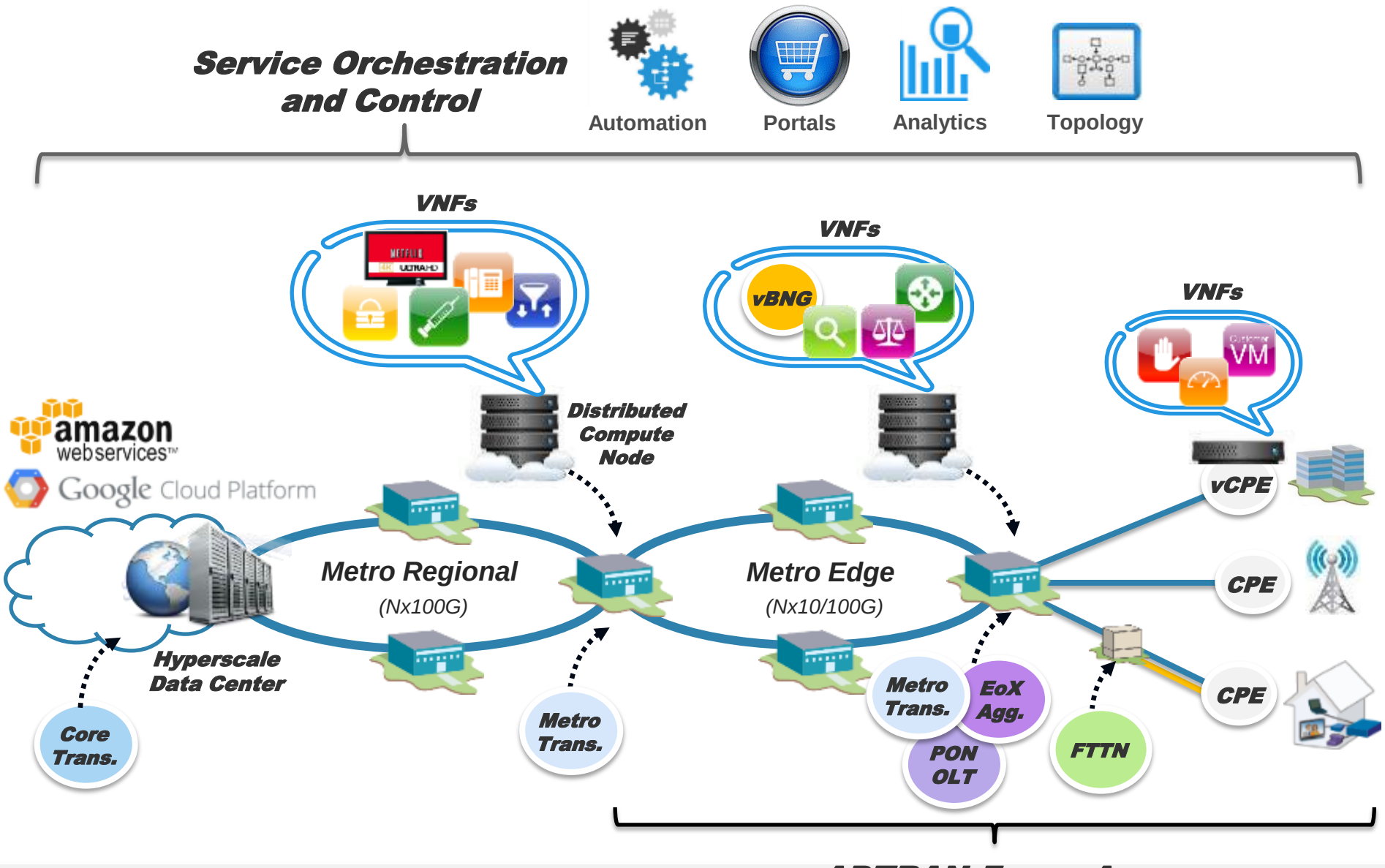
Need for agile, user-driven networks

=

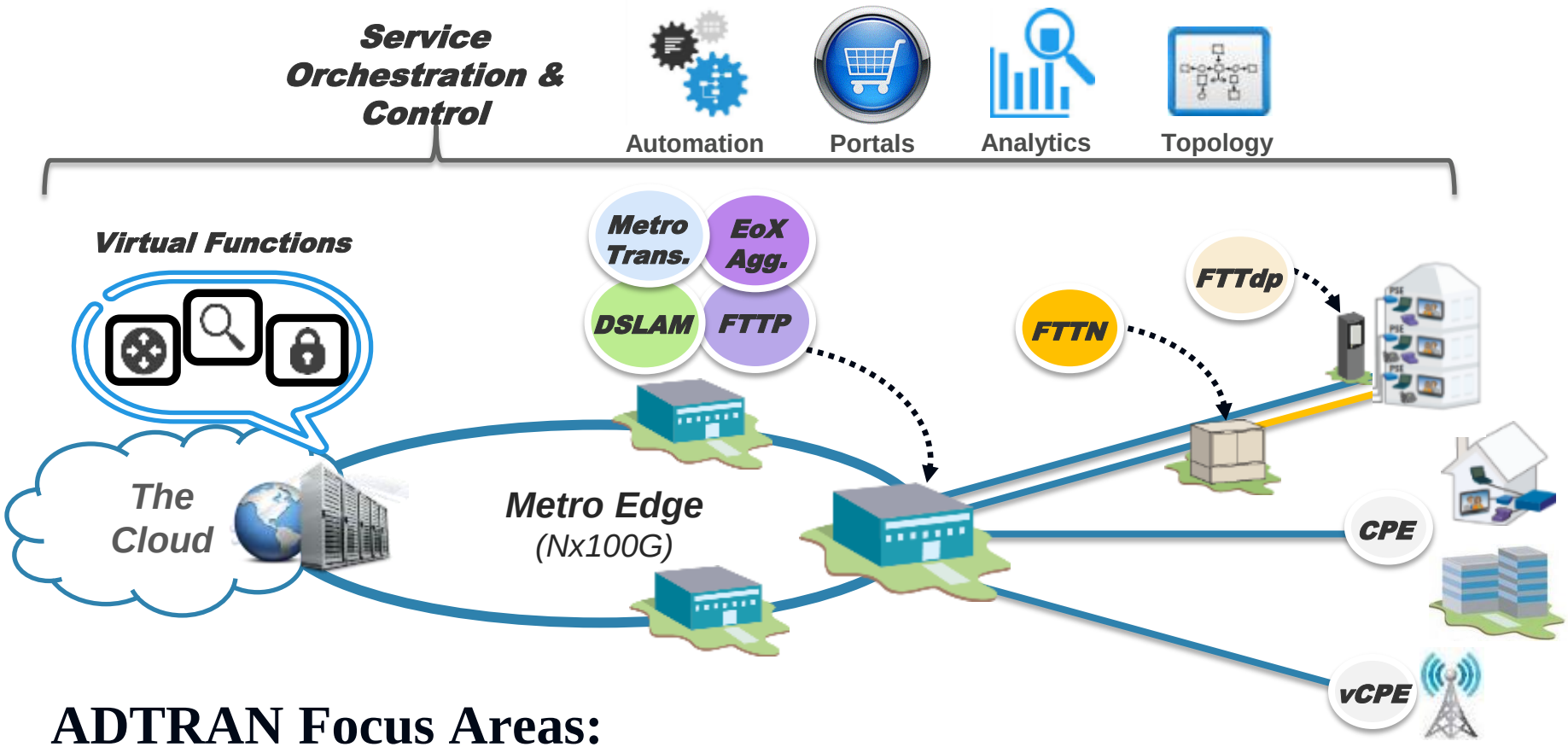
Transition to data center architectures



Next-Gen Network Architecture



ADTRAN's Focus in Next-Gen Networks



ADTRAN Focus Areas:

- Broadband access
- Metro edge fiber aggregation
- Cloud connectivity
- Network management

The Future of Access Automation: SDAN

- **SDN in Access Nodes (SDAN)**
  - Project initiated by ADTRAN and AT&T
  - Focused on defining requirements and protocols required for SDN-based provisioning of access nodes
  - Targeting completion of standard by early 2016 and PoCs late this year involving OLTs and G.fast DPUs

- **SDAN Project Goals**
  - Enable SDN-based deployment of access nodes using protocols such as OpenFlow and NETCONF
  - Identify gaps in current protocols which must be filled to meet these requirements
  - Reduce complexity, increase flexibility, optimize capability and create open architecture

Summary of Key Trends

- **Focus on Service Agility and Data Center Architectures**
  - Customer-driven networks with E2E automation are key
  - SDAN is the future of access network automation
  - Distributed NFV helping transition to software-centric networks
- **Scaling up 10G PON**
  - NGPON2 simplifies deployment of converged services over PON
  - Low cost 10G PON required to enable mass market residential
- **Maximizing copper capabilities**
  - Vectored VDSL2 continues to expand with Super Vectoring
  - Most operators around the world interested in G.fast as part of toolkit
- **Focus on Business and Backhaul Services**
  - Convergence of services over a common access network is key
  - SDN and NFV play a key role in enabling convergence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Questions?