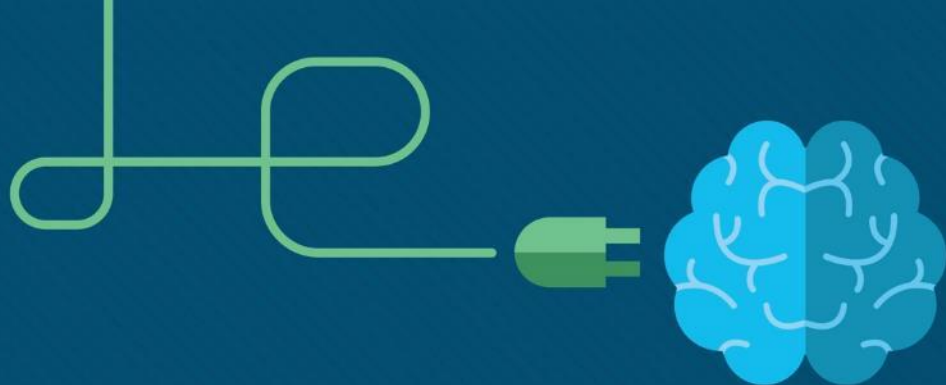




IT-Netzwerke in Transformation IT-Neuordnung in Deutschland

Entwicklungstrends in der IT-Branche und
Verwendung der e-Learning Angebote von Cisco

Carsten Johnson carsjohn@cisco.com

Februar 2019



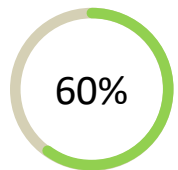
Themen

-  Entwicklung der IT-Landschaft – Wandel der beruflichen Kompetenzanforderungen
-  Kompetenzen in den neuen IT-Berufen und Networking Academy
-  Cisco Networking Academy in NRW

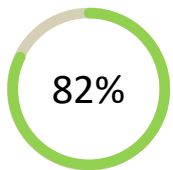
Entwicklung der IT-Landschaft – Wandel der beruflichen Kompetenzanforderungen



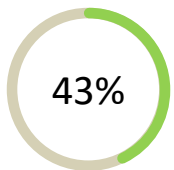
The IT Landscape Is Rapidly Evolving



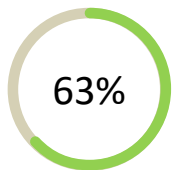
By 2023, Over 60% of enterprises will deem networking as core to their digital strategy, up from 20% today. (1)



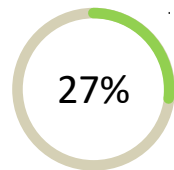
By 2022, internet video will represent 82% of all business internet traffic, VR/AR traffic will increase twelvefold.(2)



Globally, wireless devices will account for 43% of all networked devices by 2022. (3)



63% of IT leaders plan to put in place advanced networks that can dynamically meet business needs within three years. (4)



27% of IT leaders identified lack of necessary skills as a main obstacle to transitioning to an advanced network. (5)

As industries go through this digital transformation, the network architecture is changing to become vital to business agility, cybersecurity, and operational effectiveness.

The role of the networking professional is evolving and more vital than ever.

The Network is changing

Enabling IT to adapt fast and at scale

Technologies powering digital transformation



Virtualization & Cloud
Enabling new business models and global scaling on demand



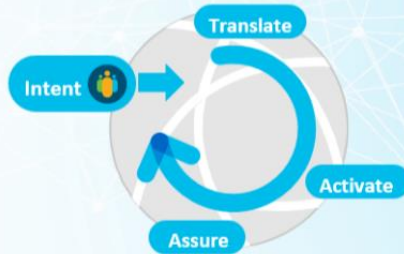
Automation
Supporting over 4 billion users plus 10 billion IoT devices



5G Mobility
Secure access to business critical applications and data



Analytics & AI
Distilling zettabytes (10^7) of data to find relevant insights



Intent-Based Networks

Achieve business objectives using DevOps principles

Charakter



Multi-Domain Networking

Unify and secure diverse networking domains

Netz-Infrastrukturen



Programmable Networks

Drive automation, agility, and scale securely

Administration

Neue Anforderungen an die IT-Infrastruktur und die neuen Technologien fordern erweiterte Kompetenzen (advanced skillset)



Digitale Geschäftsmodelle & -architekturen basieren auf Software-defined-Network (SDN)



Programmieren wird integraler Bestandteil für Systemadministration



Automatisierung und Virtualisierung breiten sich in alle Netzwerke aus



Wireless-Technologien verdrängen kabelgebundene Netzwerke



Netzwerk Device-Management entwickelt sich von CLI zu API



Wachsende Sicherheitbedrohungen verlangen neue Fähigkeiten

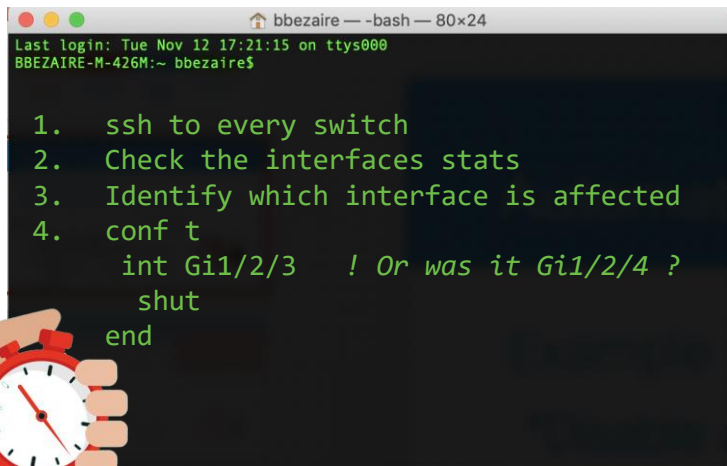
Employers expect foundational IP skills and breadth of knowledge from network admins

Automation – Save time, less mistakes

Example Business Intent:

“Disable all network access ports after 30 days of inactivity”

Manual (for EVERY switch)



```

bbezair — -bash — 80x24
Last login: Tue Nov 12 17:21:15 on ttys000
BBEZAIRE-M-426M:~ bbezair$

1.  ssh to every switch
2.  Check the interfaces stats
3.  Identify which interface is affected
4.  conf t
    int Gi1/2/3    ! Or was it Gi1/2/4 ?
    shut
    end
    
```

Automated (run the code once)



```

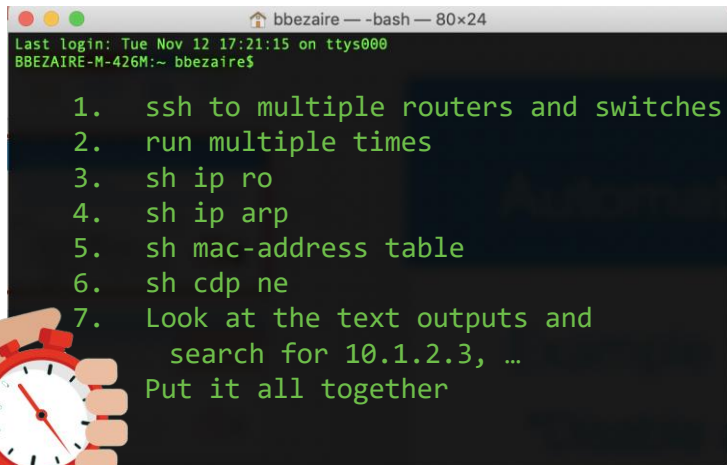
# ... some code removed for simplicity ...
for switch in my_network:
    for interface in switch:
        if interface.is_up() and interface.last_change() > thirty_days:
            interface.shutdown()
            interface.set_description("Interface disabled per Policy")
    
```

Troubleshooting – Check a single source

Example Business Intent:

CyberOps request – “Where is 10.1.2.3 in our network?”

Manual (repeat for many locations)



```

bbezair — -bash — 80x24
Last login: Tue Nov 12 17:21:15 on ttys000
BBEZAIRE-M-426M:~ bbezair$

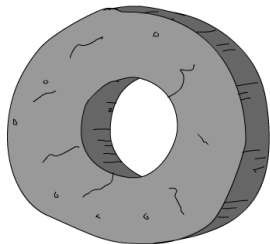
1.  ssh to multiple routers and switches
2.  run multiple times
3.  sh ip ro
4.  sh ip arp
5.  sh mac-address table
6.  sh cdp ne
7.  Look at the text outputs and
    search for 10.1.2.3, ...
    Put it all together
  
```

Automated (code checks for you)



```

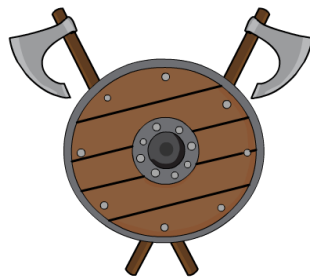
import requests
ip = input("What IP you want to find? ") # 10.1.2.3
a = {"X-Auth-Token": "..."}
r = requests.get("http://APIC-EM/api/v1/host?hostIp="+ip, headers=a).json()
print(r)
  
```

Stone Age

Spanning Tree

VLANs



Bronze Age

Routing Protocols

WAN Design

IP-magedon



The Renaissance

SDN

OpenFlow

Controllers

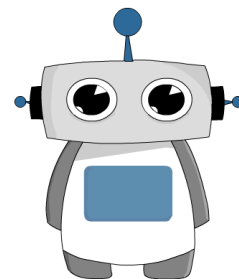
Overlays

MP-BGP

VXLAN

Micro-Segmentation

White Box



Programmable Age

Cloud

Python

REST / APIs

NETCONF / YANG

“Fabrics”

Network Function
Virtualization (NFV)

Containers

DevOps

NetDevOps!

The Four Ages of Networking.....

Beispiel: Meraki Dashboard und Datenanalyse



Meraki MR
Wireless LAN



Meraki MS
Ethernet Switches



Meraki MX
Security Appliances



Meraki SM
Mobile Device
Management

Beispiel: Dashboard API

- List devices in the network

```
GET /networks/:networkId/devices
```

- Get device information

```
GET /networks/:networkId/devices/:serial
```

- Get device clients

```
GET /devices/:serial/clients
```

- Get SSID information

```
GET /networks/:networkId/ssids
```

What Does Digital Transformation Mean for Networking Careers?

Technologies
powering digital
transformation
require new
skillsets



Programming skills becoming essential to network admins

Automation and virtualization now extend across all network domains

Wireless technologies now prevalent in access networks

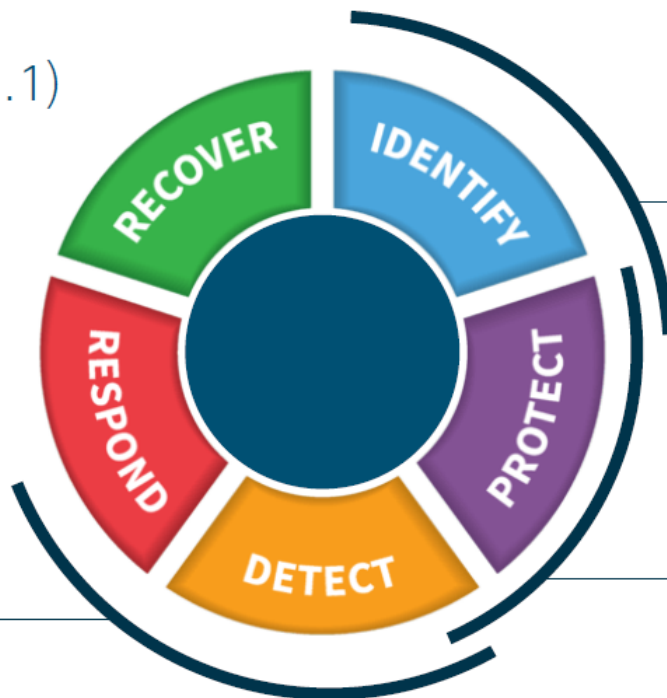
Expanding **security** threats require new analytics and corresponding skills

NIST Cybersecurity Framework

NIST Cybersecurity Framework Functions (v1.1)

www.nist.gov/cyberframework

- Detecting Intrusions
- Monitoring, analyzing
- First response



- Discovering Vulnerabilities
- Modeling Risk
- Suggest mitigations

- Preventing Intrusions
- Hardening systems
- Securing, Implementing security policies

Neuordnung der IT-Berufe und Networking Academy

Cisco Networking Academy



*YEARS OF
CHANGING
WORLDS*



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Courses Develop Networking Professionals

EXPLORATORY



Intro to IoT
Intro to Cybersecurity

Start with technology awareness and career discovery.

FOUNDATIONAL



PCAP: Programming Essentials in Python
NDG Linux Essentials
IoT Fundamentals: Connecting Things

Move on to fundamental principles, procedures, and practices.

CAREER READY



CCNA Routing & Switching Curriculum 1, 2, & 3

Learn how networks operate, from protocols and services to network management.



CCNA Security

Delve deep into networking security, focusing on design, implementation and protection of secure networks.

CERTIFICATION AND EMPLOYMENT

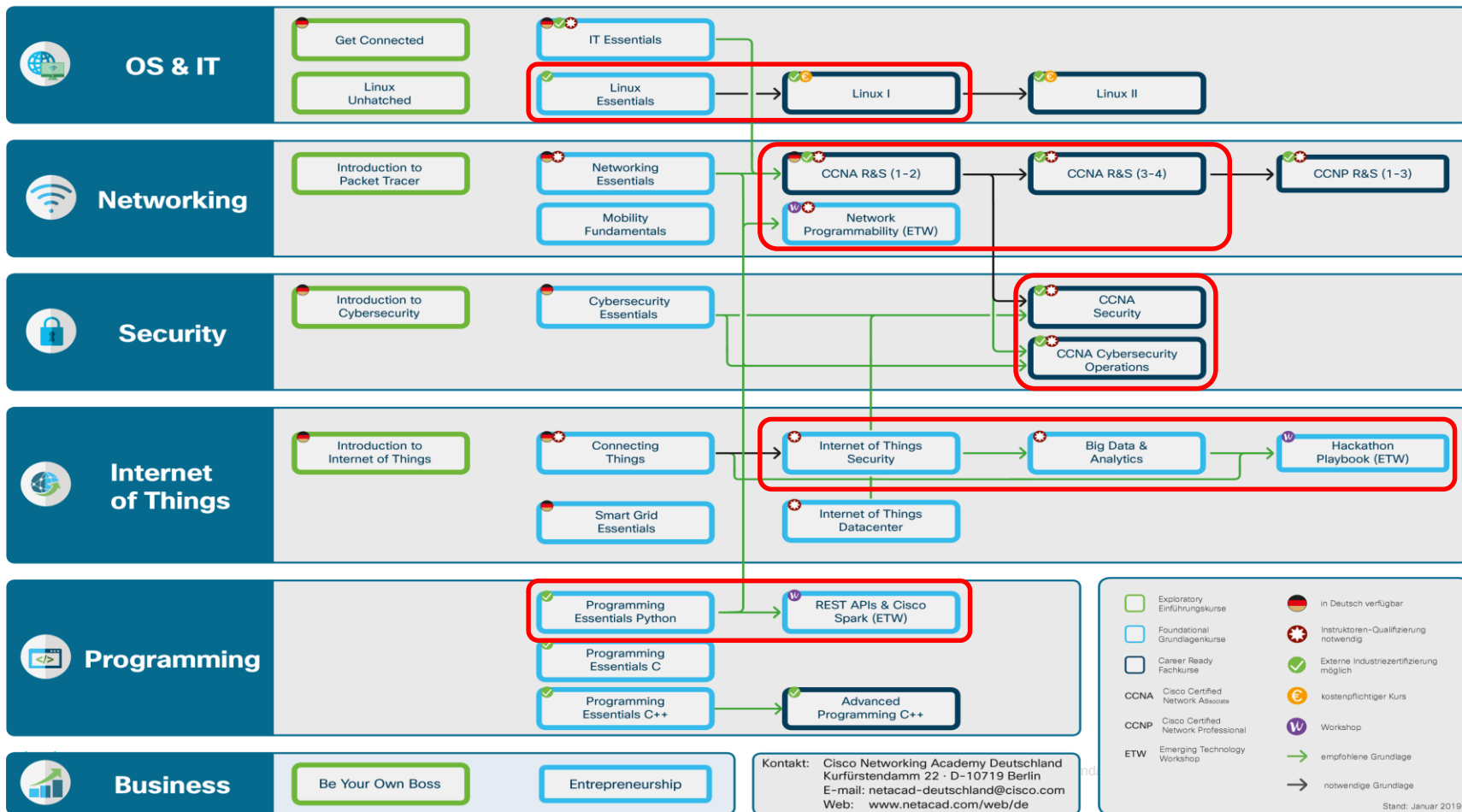


Certification opportunities

Stackable certifications attract employers, and our career programs help connect students to jobs.



Promising job prospects



NetAcad Cybersecurity Courses

