Will I Be Replaced by a Script?

The Future of Network Engineering

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Who's talking?

- 15 years in networking
- On computers since single digits
- Spoken at NOGs/NOFs in 34 countries
- Started "SDN" research in 2011
- Principal Architect at Myriad Supply
- http://ChrisGrundemann.com

So… Will we be replaced by scripts?

Let's discuss…

a short answer:

No

a slightly longer answer:

Yes

a more accurate answer:

Maybe

Let's Start Over

- Why are we talking about this?
- Who are we talking about?
- What might the future hold?
- What can we do about it?

Why

are we talking about this?

What's a Script?

"A program that automates the execution of tasks that could alternatively be executed one-by-one by a human operator."

What is SDN?

- Ask 10 people, get 12 answers
- Openflow vs. Overlay
- Intent based networking
- Abstraction
- A bunch of scripts?

A trend towards Automation

- What we really want to do is:
  - Put information into the network
  - Get information out of the network

- Humans are prone to make mistakes

- In a changing world; Agility is king

The boogey man

- Automation eliminates human jobs.
  - The robots are coming!
  - The robots are coming!

- You can pry the CLI from my cold, dead, hands…
  - I'm not a programmer (and I don't want to)
  - What's an API?

Simplicity vs. Complexity

"Make things as simple as possible, but not simpler."

- Revisiting abstraction
  - Closing your eyes doesn't make the world disappear

Who

are we talking about?

Internal IT (the corporate net)

- Generalists
- Operations focused

Data Centers (public facing)

- Dedicated network staff
- Specialized functions

Service Providers (ISP/NSP)

- Networking company
- Highly specialized functions

Consultants

- Focus on
  - Design
  - Implement
  - Troubleshoot

Who'd I miss?

- Do you have a NetEng job I skipped?
  - Tweet me: @ChrisGrundemann

What

the future looks like from here...

Forget vertical, go horizontal

- Architecture
- Engineering
- Operations
- Provisioning
- Help Desk

Does design still matter?

- Humans innovate
- Building efficiencies
- Understanding the system
- Products, services, and business drivers
- **Impact: new tools & constraints**

Do we still need to build networks?

- Calibrate intent
- Capacity planning
- Test functionality of new design
- Implement design through software
- **Impact: less MoP, more code**

What about troubleshooting?

- Advanced monitoring
- Autonomous remediation
- Complex failures still present
- Software systems deeply integrated
- **Impact: reduced headcount**

Who provisions services?

- Portals & APIs
- Pre-built scripts
- Templated configurations
- Intent based policy control
- **Impact: essentially eliminated**

Do I still need a help desk?

- Someone has to answer the phone
  - Right?
- What about Alexa, Siri, Cortana, etc...
- Don't forget APIs and portals
- **Impact: vast reduction**

In Short:

If you are not replaced by scripts, they will become your colleagues

Can a script replace ME?

- People vs. Processes
- Repetition vs. Innovation
- Quantitative vs. Qualitative

Now

what?

My biggest concern

- The NetEng on ramp…

The bigger picture

- Automation is everywhere
  - Robot agenda on track
- Goldman Sachs sacks 600 traders
  - Replaced by 200 IT pros
- Seven Stages of Robot Replacement
  - Thanks Kevin Kelly

What did you expect?

- The only constant is change
- You work in technology
- Learn and grow

Don't forget

- IoT
- Video
- Digital
- Security
- Population

The upside

- This is really just the beginning

- You have an opportunity to lead

- Scripting / automation is more efficient
  - More efficient = More money

- "What's NetDevOps? Why?" (LC/N66)
  - https://youtu.be/YzfX7TS95W8

Where should I start?

- Tutorial: NetOps Coding 101 (DS/N64)
  - https://youtu.be/EYL64kSG7kI
  - https://youtu.be/2o_beIvreiQ

- Tutorial: NetOps Coding 201 (DS/N66)
  - https://youtu.be/3P3x09ZrT0E

- More automation videos at:
  - https://www.youtube.com/playlist?list=PLqjLDraZaSBEvEBWA8WRwl60-aE77WEAh

More resources!

- Network Automation Tutorial (NAPALM)
  - https://www.dravetech.com/presos/network_automation_tutorial.html#/

- https://github.com/

- https://www.python.org/

- https://stackoverflow.com/

Thoughts from Tim O'Rielly

- Scripts are workers, developers are managers

- Algorithms are power tools for our minds

- Physical and digital boundaries are blurring

https://youtu.be/EkS_HArfu3M?t=35m10s

My best advice

- Creativity
- Communication
- Constant learning
- Construe meaning
- Don't panic!