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=PLqjLDraZaSBEvEBWA8WRwI60-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!