



Cisco Networking Academy and NDG Present

# Give Students Limitless Opportunities with Linux Courses



Welcome to the 2nd session of the *Intro to Linux* webinar series!

- Use the Q and A panel to ask questions.
- Use the Chat panel to communicate with attendees and panelists.
- A link to a recording of the session will be sent to all registered attendees.
- Please take the feedback survey at the end of the webinar.



# Presenters and Panel

- Rich Weeks – NDG President
- Jorge Leiton – Cisco Learning Product Manager
- Raoul Bhatia – Cisco Platform and Service Operations Manager
- Helmut Heise – Cisco TAC Wireless Engineer
- Nick Goldwater – Cisco TAC Engineer

# Agenda

- Summarize information from session 1
  - Why learn Linux? Job opportunities for people that know Linux.
- Cisco team members will share how they utilize Linux at Cisco
  - Cisco Service Grid
  - Cisco Linux and Wireless
  - Linux @ Work - Why is Linux important?
- Linux courses available via Cisco Networking Academy
- Questions and Answers

# Linux is Everywhere!



# THE WORLD RUNS SMARTER WITH LINUX



**99%** of the world's  
top supercomputers  
run Linux



**1.4 Billion** active  
users of Linux-based  
Android devices



**80%** of all stock  
exchanges rely  
on Linux

# LINUX GOES WHERE NO MAN HAS GONE BEFORE



**32** space missions  
completed with Linux



Linux is helping NASA's  
**Curiosity Rover**  
explore Mars

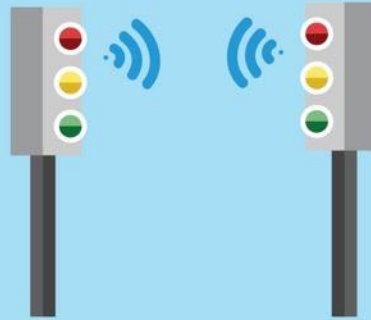


**SpaceX** uses Linux  
on the Dragon and Falcon 9  
spacecraft

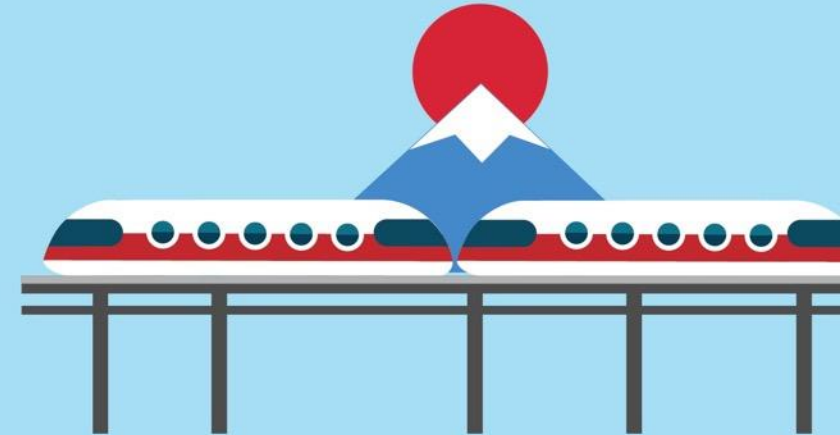
# LINUX IS TRANSFORMING TRANSPORTATION



**US air traffic**  
control runs on Linux



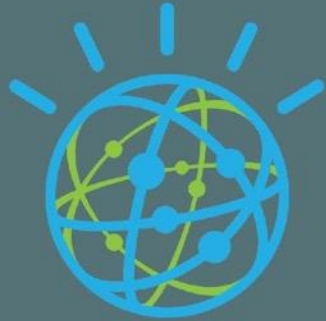
**Queensland Motorways**  
relies on Linux for smart traffic  
management



Linux helps run  
**bullet trains** in Japan



# FROM BIG DATA TO THE BIG BANG



Linux helps IBM's Watson analyze  
**200 Million** pages of  
clinical data in 15 seconds



**“The God Particle”**  
was discovered using CERN's  
Linux-powered Large Hadron  
Collider



**Google, Amazon, even  
Microsoft** use Linux to  
power their cloud services

It's not just one type of job.



System Admin



Cloud Computing



DevOps



Networking



Cyber Security



Design/Arch  
Planning



Data  
Management

# Linux Skills Are In Demand

Indeed.com Job Search Keyword = Linux	
76,594	China
63,929	USA
19,867	Japan
19,030	India
10,965	England
8,576	France
8,362	Germany
1,255	Australia
1,187	Mexico



## Linux jobs in United States

Sort by: **relevance** - [date](#)

### Salary Estimate

\$70,000+ (55568)  
\$85,000+ (44823)  
\$95,000+ (33748)  
\$100,000+ (27478)  
\$115,000+ (11099)

### Job Type

Full-time (54002)  
Contract (8602)  
Internship (1193)  
Temporary (1086)  
Part-time (864)  
Commission (70)

### Location

New York, NY (2845)  
Seattle, WA (2238)

what:

Linux

job title, keywords or company

where:

United States

city, state, or zip

Find Jobs

Jobs 1 to 10 of 63,929

**New!** [Join Indeed Prime](#) - Get offers from great tech companies

Show: **all jobs** - [37,829 new jobs](#)

### Network/Server Administrator (IDC Onsite)

CAMiWell - Santa Clara, CA

Position: Network/Server Administrator (5) Job type: Full-time City: Santa Clara, CA, USA Start date: April 2016 Requirements: \* Fluent in English and Chinese...

[Easily apply](#)

17 days ago - [email](#)

[Sponsored](#)

### Linux Technical Support

Linode - Haddonfield, NJ

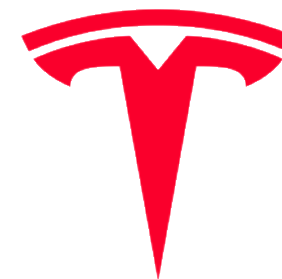
Linux System Administration experience. Comfortable with the Linux command line. Familiarity with common Linux server applications such as Apache2, Nginx,...

[Easily apply](#)

30+ days ago - [email](#)

[Sponsored](#)

# Companies That Use Linux



WIKIPEDIA

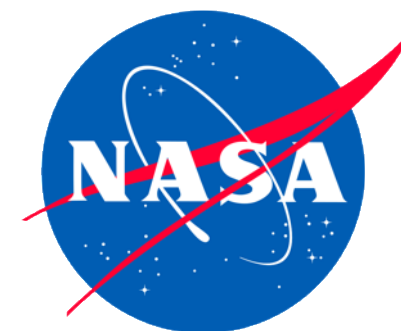


Google

TESLA

NETFLIX

IBM



amazon



SPACEX



# Cisco ServiceGrid

Cisco Networking Academy – Linux in the Industry

Raoul Bhatia ([raobhati@cisco.com](mailto:raobhati@cisco.com))

Platform and Service Operations Manager

November 2016



# Agenda



- Introduction
- What is Cisco ServiceGrid?
- Linux on the Server
- COSI – Open Source at Cisco
- Linux on the Desktop
- Closing Words

# Introduction

## Who am I?

---

- Platform and Service Operations Manager for the Cisco ServiceGrid solution
- My team currently operates 300+ Linux servers around the globe

## Background – Powered by Linux

---

- Cofounded and operated an Internet service provider for 8 years
- 10+ years of work experience in the Internet industry, including high-availability, data center, network, and services operations
- Contributor to various open-source projects



A background network diagram consisting of various sized blue circles (nodes) connected by thin white lines (edges), forming a complex web-like structure across the entire slide.

# What is Cisco ServiceGrid?



# What is ServiceGrid?

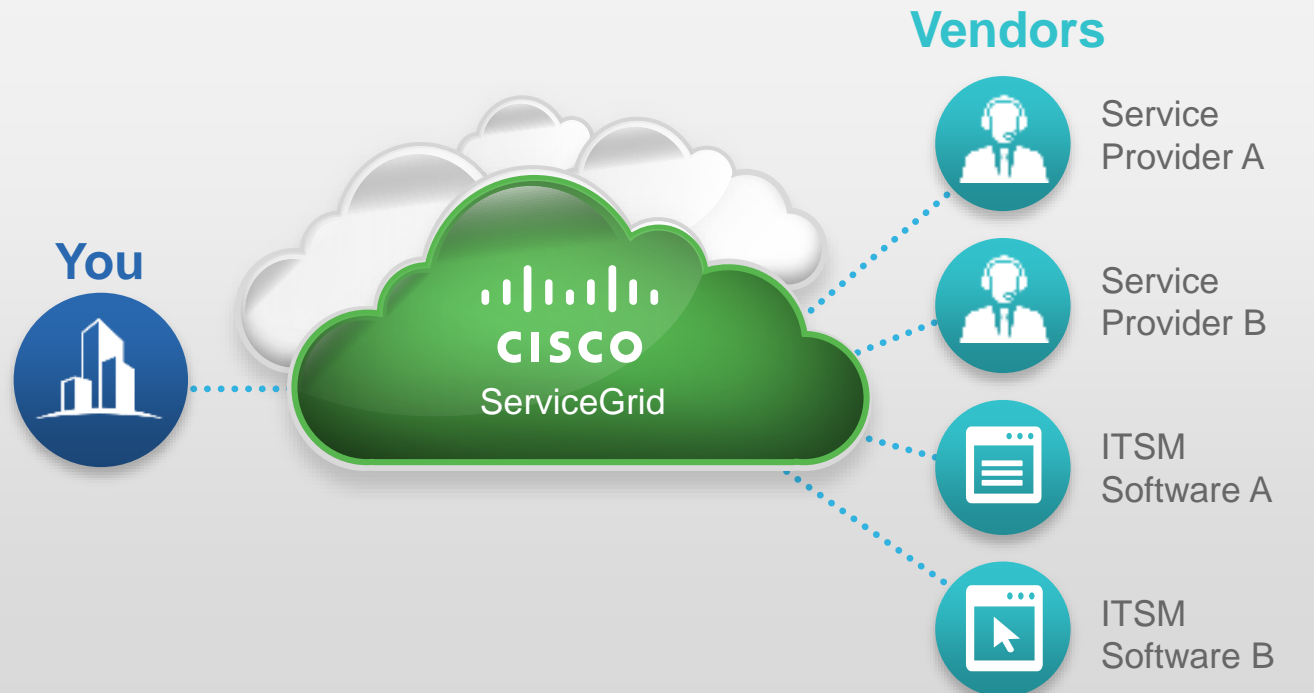
## Cisco's Service Management Integration SaaS Offer

➤ Standardized, best practice ITSM integration

➤ Automate business processes and support workflows

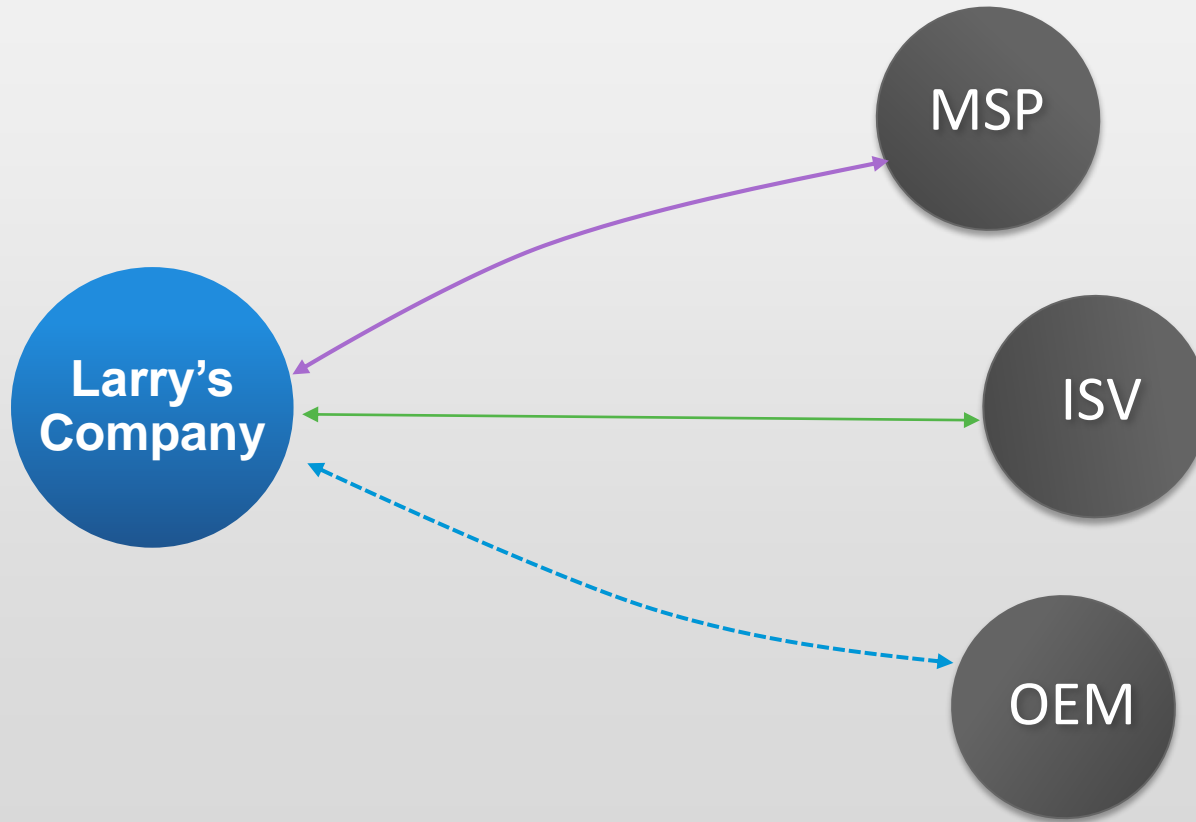
➤ "Connect once – connect all"

### Multi-Party Service Collaboration



# Managing Third Party Support

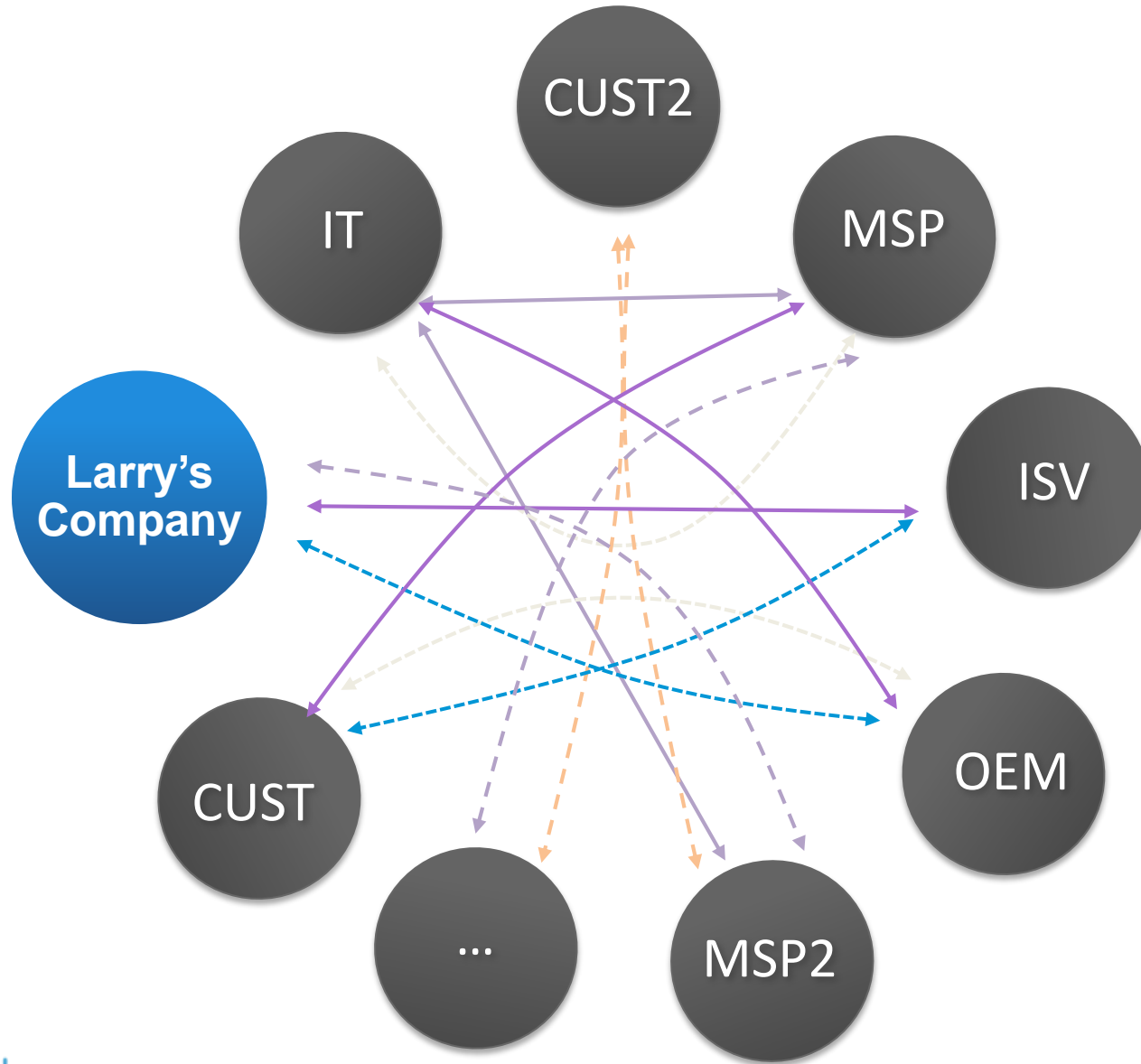
Individual, Custom Developed Connections to Service Providers, Vendors, OEMs



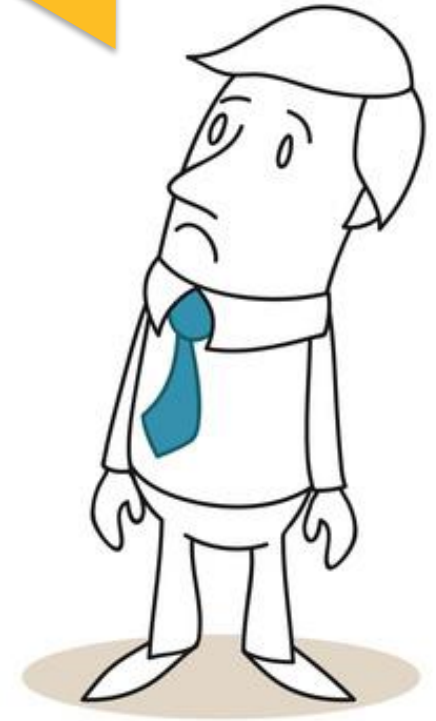
Hi! I'm Larry.



# Over Time The Service Ecosphere Grows...



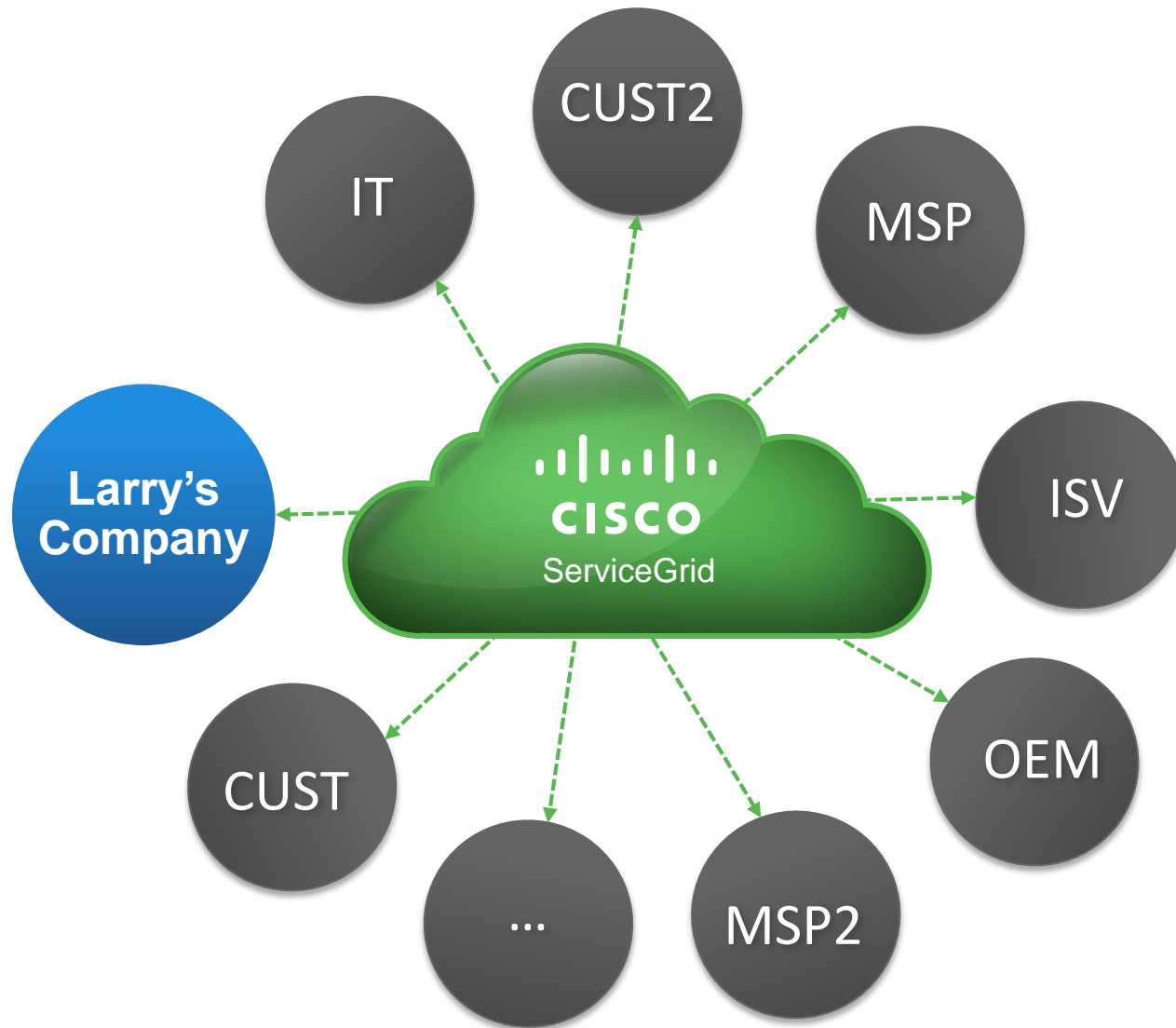
Not scalable  
Poor visibility  
High costs



# There Must Be a Better Way ....



# ServiceGrid – Connect Once – Connect All!

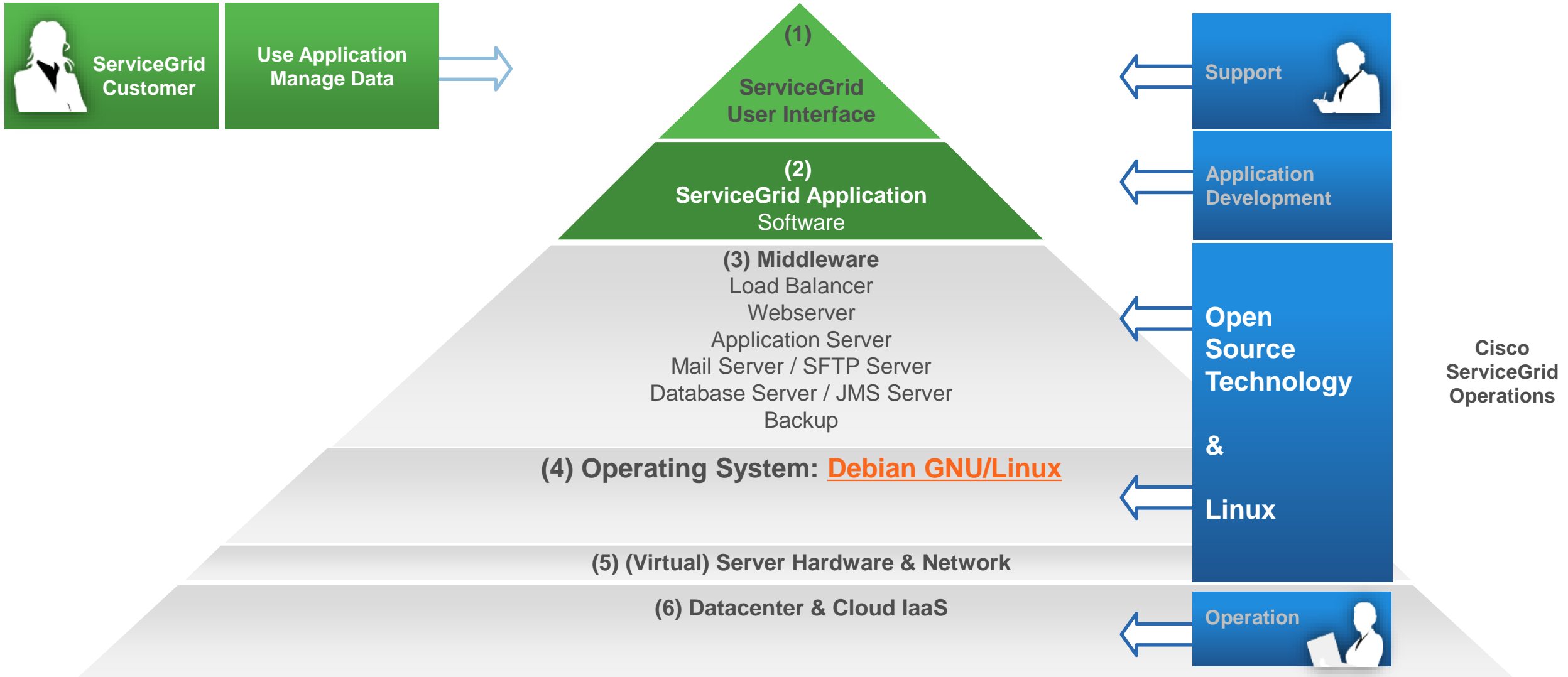


A background network diagram consisting of various sized blue circles (nodes) connected by thin white lines, creating a complex web-like structure across the entire slide.

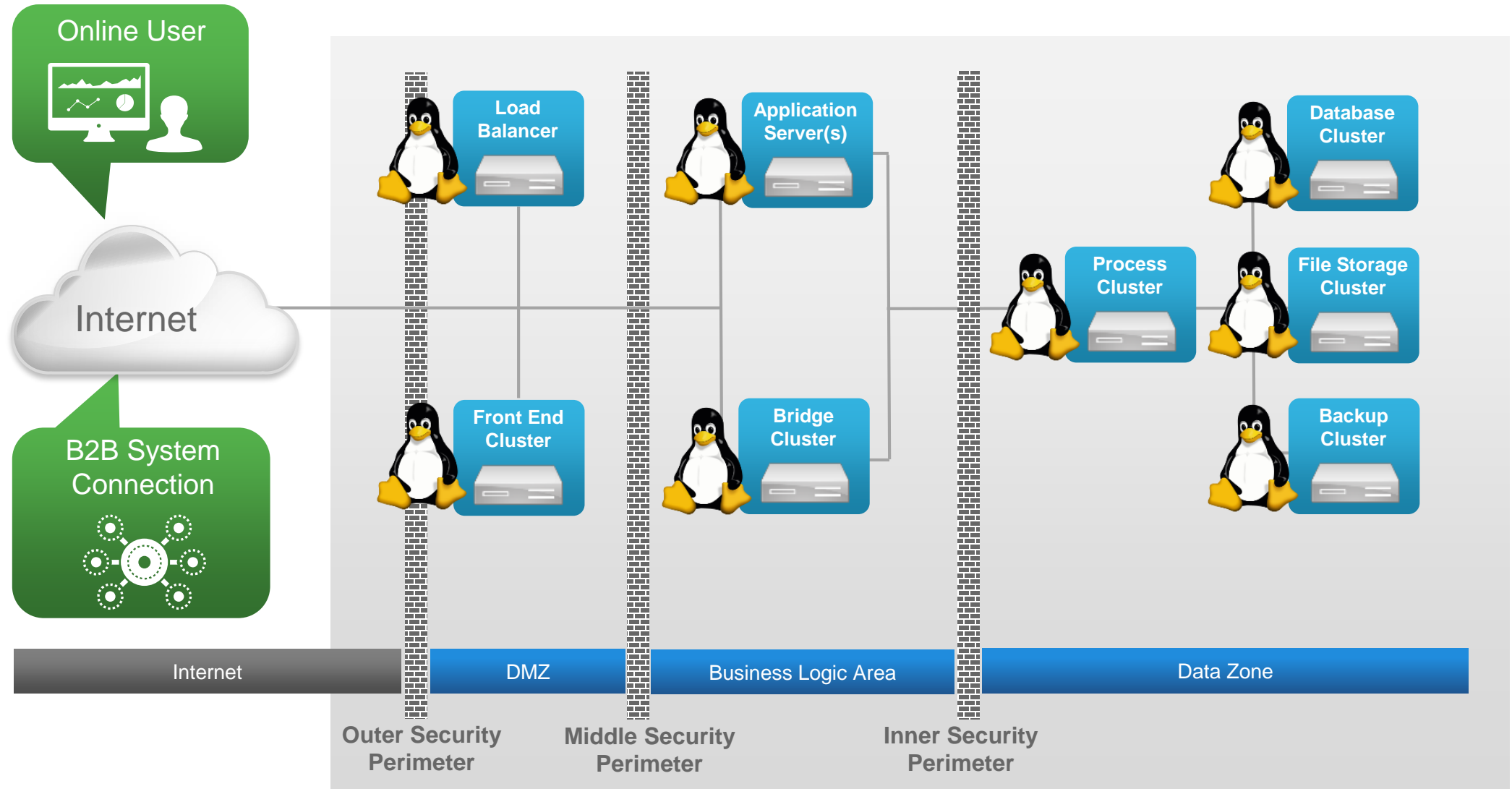
# ServiceGrid – Technical Details

How and where we are using Linux and Open Source technology.

# Where Linux is used



# Let's Peek into the Data Center ...





A background network diagram consisting of various sized blue circles (nodes) connected by thin white lines (edges), creating a complex web-like structure across the entire slide.

# How Linux is used in our Team

# How Linux is used in our Team



## Linux on the Server

- Debian GNU/Linux – for many internal & external services
- *Other Linux Distributions throughout Cisco include CEL, RHEL, SuSE, etc.*



## COSI

- Open Source at Cisco



## Linux on the Desktop

- Linux available as a Desktop OS of choice
- Adhere to company policies (Security, encryption, backup, etc.)

A background network diagram consisting of various sized blue circles (nodes) connected by thin white lines, creating a complex web-like structure across the entire slide.

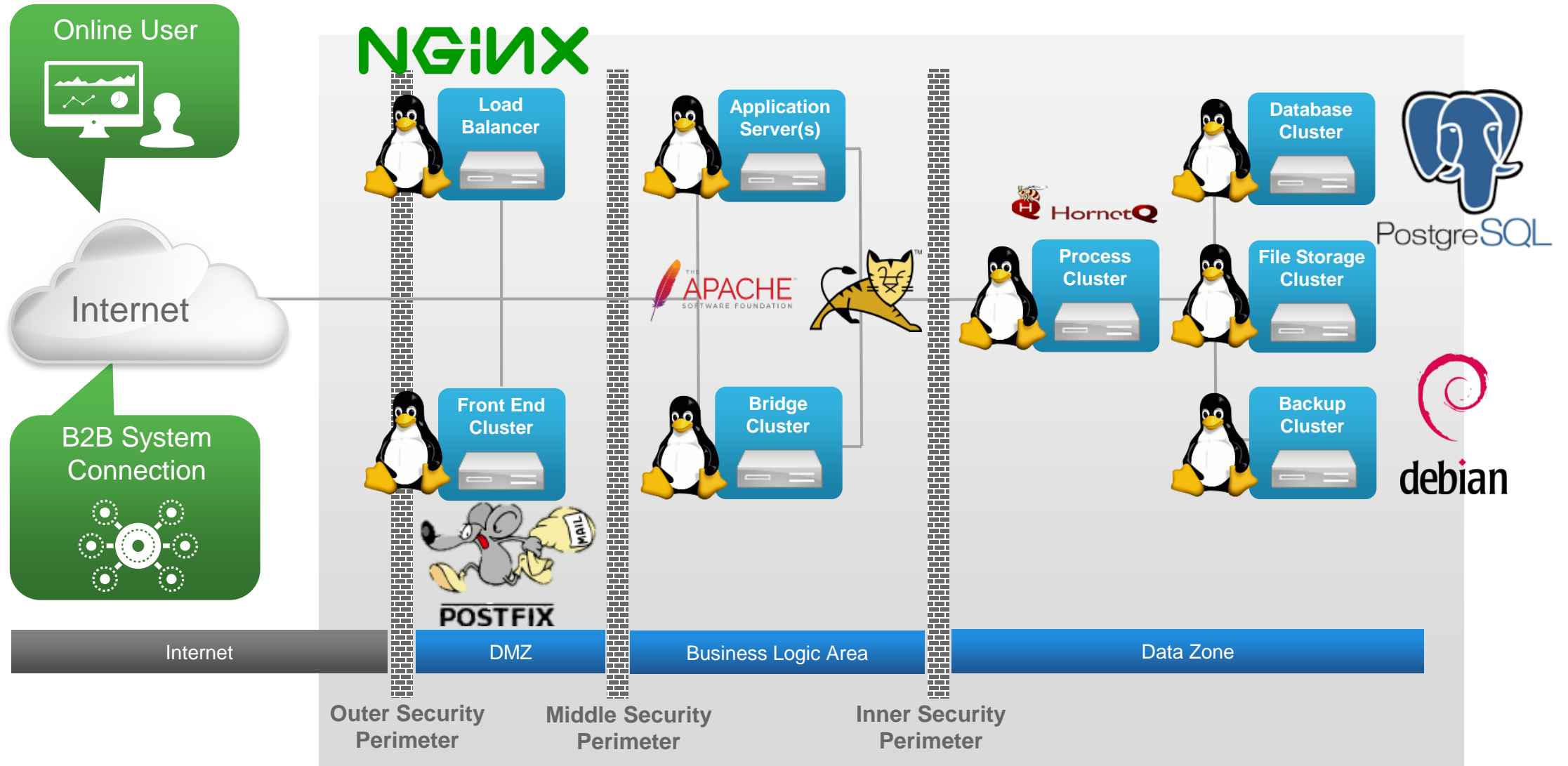
# Linux on the Server

# Examples of Open Source Software

- Debian GNU/Linux (Operating System)
- Nginx & Idirectord (Webserver, Load balancer)
- Postfix (Mailserver)
- ProFTPD (SFTP Server)
- Apache Tomcat (Java Application Server)
- HornetQ & Apache Artemis (JMS Server)
- PostgreSQL (Database)



# Back into the data center ...



# Examples of Supporting Infrastructure

- OpenStack (IaaS)
- Libvirt & KVM (Virtualization)
- Puppet (Configuration Management, Infrastructure as a Code)
- “LAMP” Stack (Management Webinterface)
- Git (Version Control System)
- Gitlab (Git repository management)
- NRPE (Monitoring)
- Shell Scripts - Wherever we need a quick solution ;-)



A background network diagram consisting of various sized blue circles (nodes) connected by thin white lines (edges), forming a complex web-like structure across the entire slide.

# COSI - Open Source at Cisco

# Cisco Commercial and Open Source Initiative (COSI)

## Goal

- Use of and contributions in Open Source
- Third party software & license compliance

## What Cisco does

- Use of Open Source software in Cisco products, i.e. Cisco ServiceGrid
- Givebacks to the open source community
  - i.e. Eclipse Foundation, Linux Foundation, Apache Foundation, Letsencrypt, OpenStack, SpamAssassin, Puppet, gazillion of small contributions, etc.
- Support standards development (i.e. RFCs)

[cisco.com/c/en/us/about/open-source](http://cisco.com/c/en/us/about/open-source)

[cisco.com/c/en/us/about/open-source/contributions](http://cisco.com/c/en/us/about/open-source/contributions)







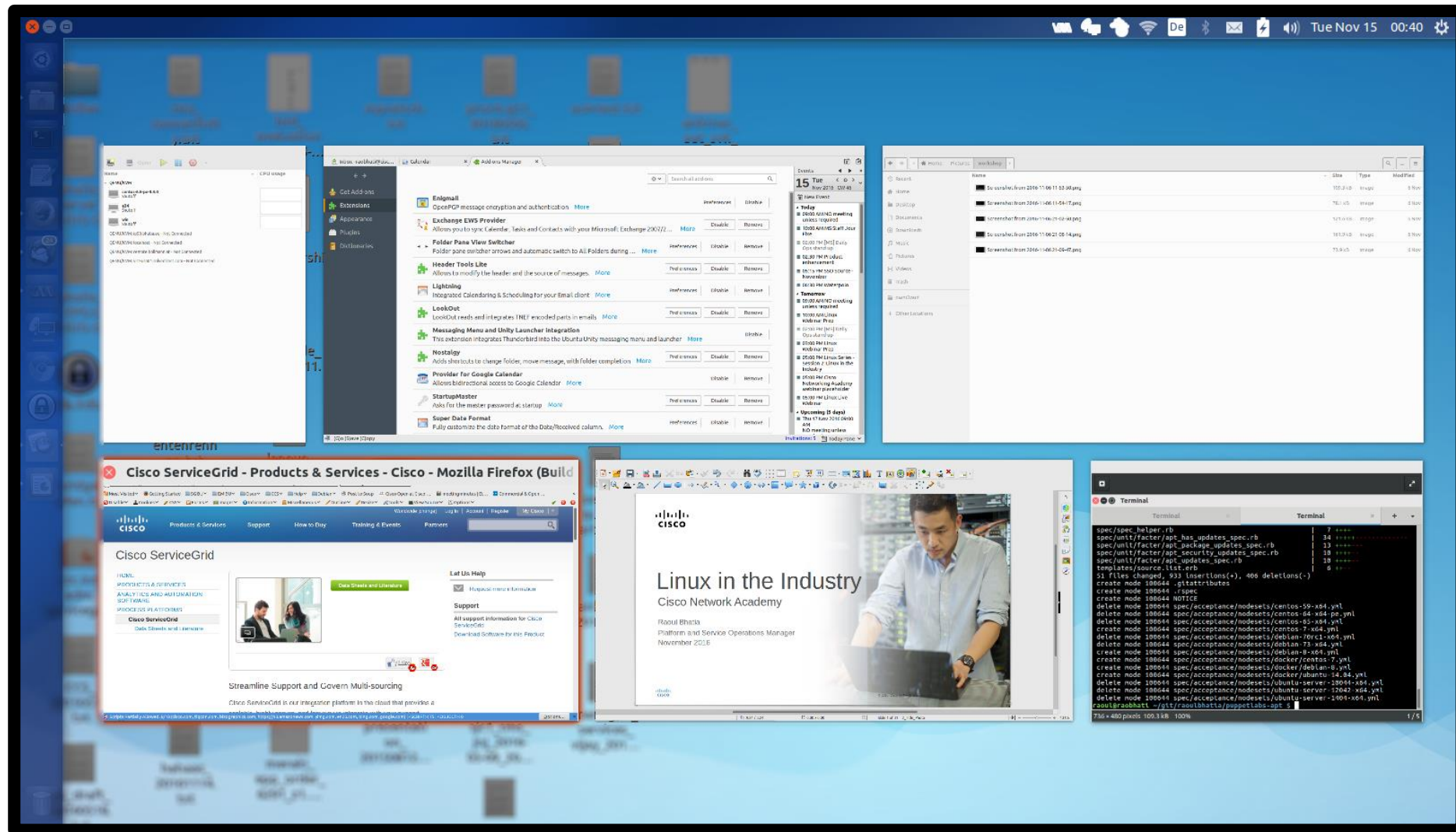
# Linux on the Desktop

# Linux on the Desktop



- Personal Preference (10 years)
  - Firefox, Thunderbird, LibreOffice
  - Huge software repositories
  - Tools that I love: Shell scripts, SSH, ...
- Security is important
- Comply to Cisco policies
  - I.e. Full disk encryption

# My Linux Desktop



A background network diagram consisting of a complex web of interconnected nodes and lines, rendered in a light blue color against a darker blue background. The nodes vary in size, and the lines represent connections between them, creating a dense, interconnected structure.

# Linux Rocks!

# ServiceGrid Resources



[cisco.com/go/servicegrid](https://cisco.com/go/servicegrid)



[YouTube ServiceGrid](#)



[@ ServiceGrid](#)



## CONTACT

Raoul Bhatia  
Platform and Service Operations

Email: [raobhati@cisco.com](mailto:raobhati@cisco.com)

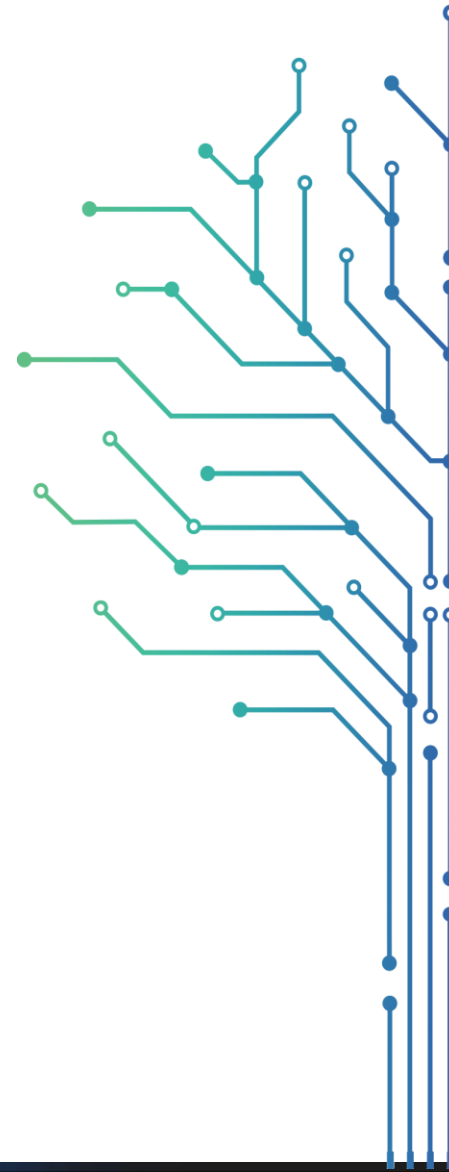
LinkedIn: <https://at.linkedin.com/in/raoulbhatia>

Xing:

[https://www.xing.com/profile/Raoul\\_Bhatia](https://www.xing.com/profile/Raoul_Bhatia)

# Linux and Wireless

Helmut Heise

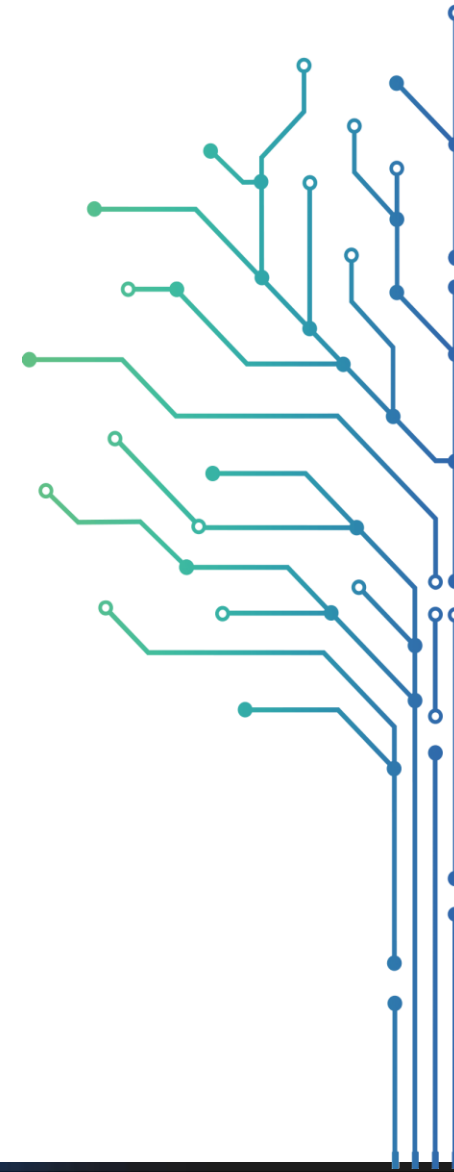


# Introduction

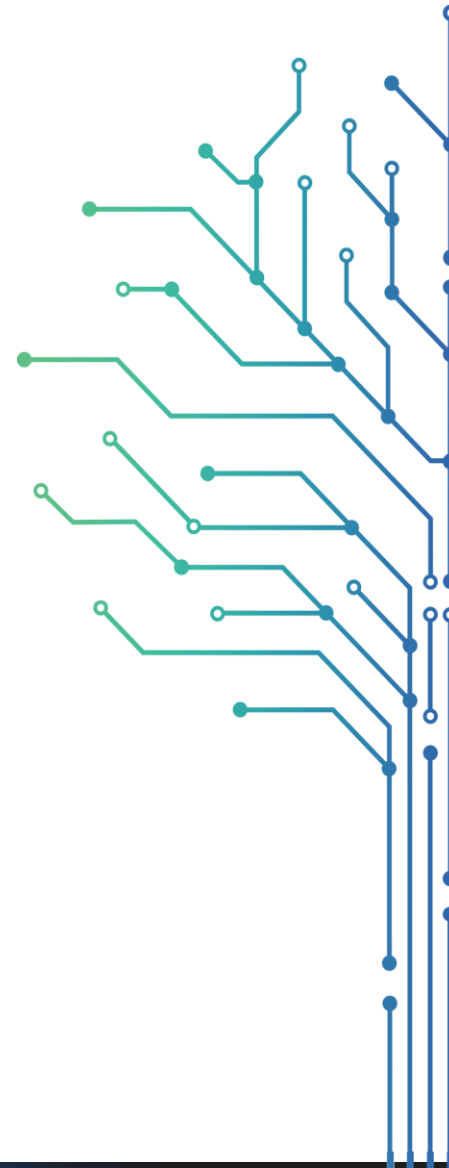
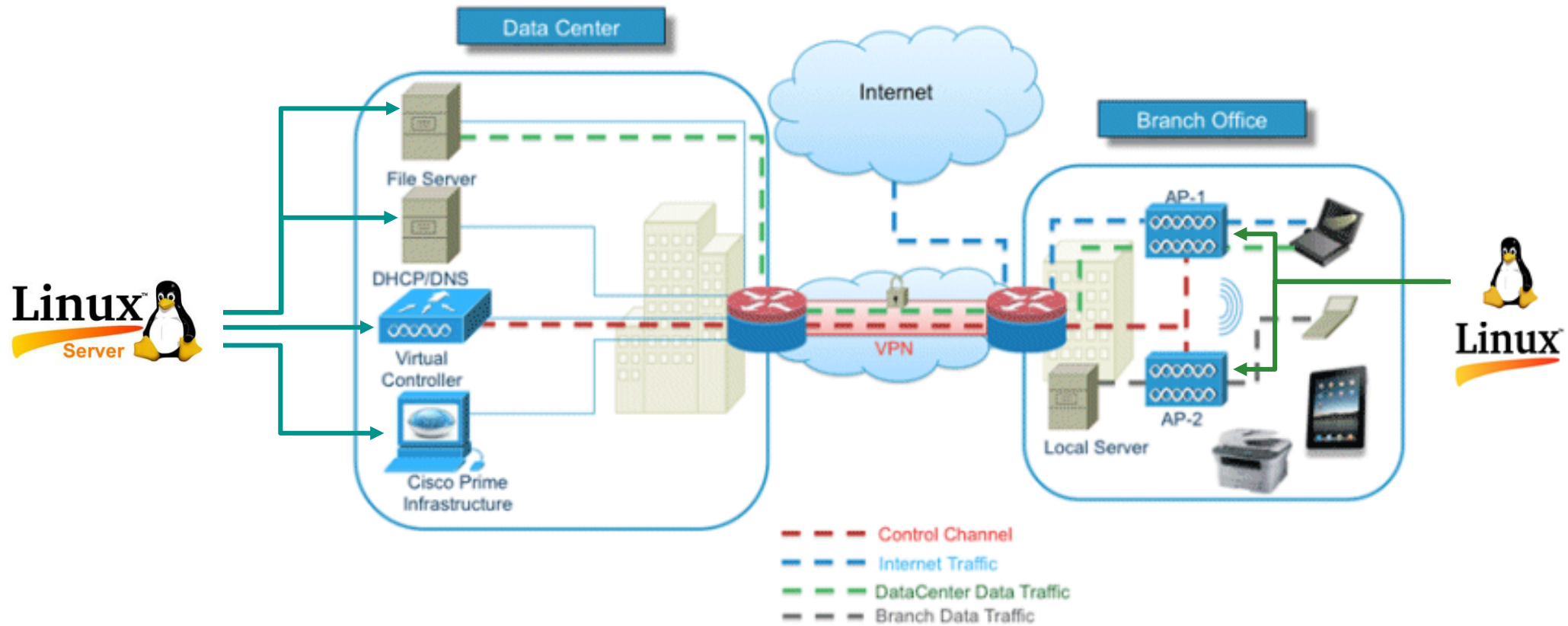
## Who am I?

---

- Cisco TAC (Technical Assistance Center) Wireless Engineer
- My team currently operates
  - Wireless controllers
  - Access points
  - Wireless phones
  - Large layer 2 and 3 deployments
- I have about 8 years working very close with Linux servers

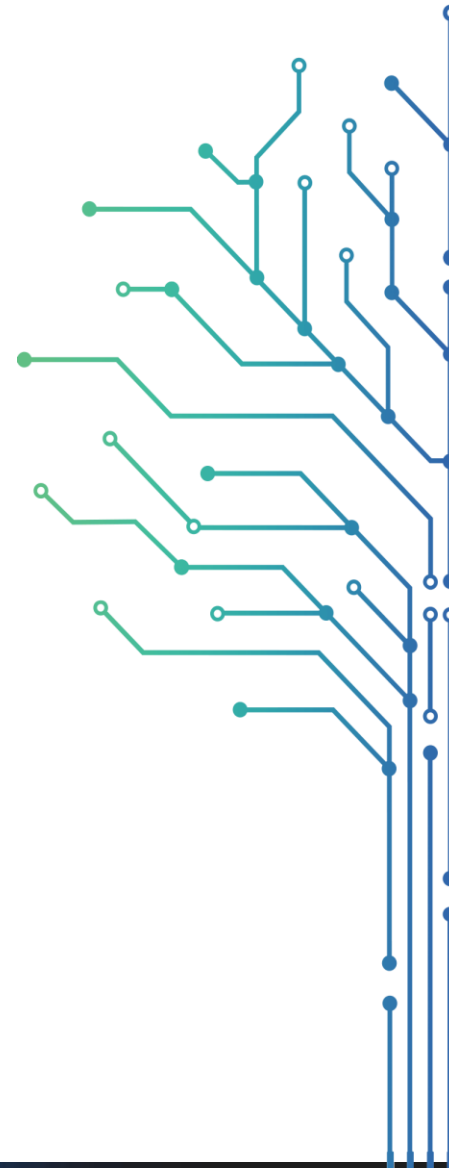
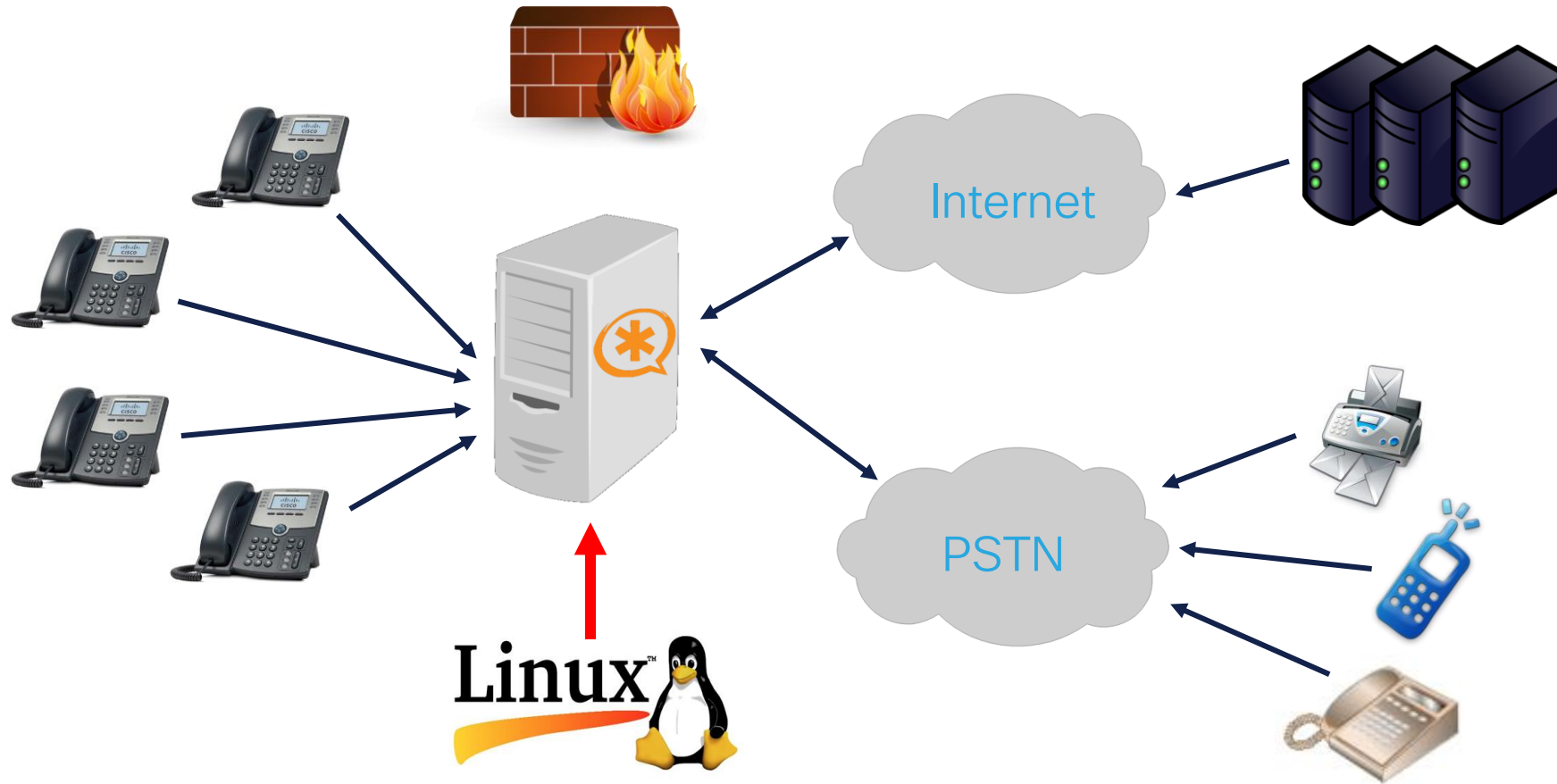


# Linux in a regular Wireless TAC Day





# Linux in a regular Wireless TAC Day





# Linux @ Work

Why is Linux important?

Nick Goldwater  
ngoldwat@cisco.com

WAAS



Nexus



ASA



WCS



IOS-XE  
ASR1K



IOS-XE ISR-4400



VIRTUALLY ALL CISCO PRODUCTS MAKE USE OF OPEN SOURCE.

**I support a product called APIC-EM**



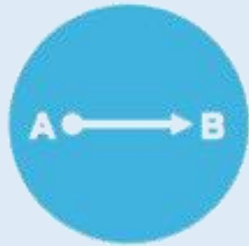
In a nutshell:

APIC-EM is the mechanism to separate the **what** from the **how**.

In other words, you tell APIC-EM what it is you want to do and then it does it for you.




# APIC-EM – Controller based Automation



**SIMPLE**

Manual  Automated

Box-Centric  Network-wide

Provision in Months  Hours



**OPEN**

Static  Programmable API

Greenfield  Brownfield + Greenfield

Expert CLI  Policy + GUI

# Welcome to the Cisco APIC-EM Appliance - Powered by Grapevine

System information as of Sun Nov 13 21:26:59 UTC 2016

System load: 0.97                      Processes:                      546  
Usage of /: 8.6% of 428.79GB    Users logged in:              1  
Memory usage: 50%                      IP address for eth0:          172.18.123.11  
Swap usage: 0%                         IP address for grape-br0: 169.254.0.1

APIC-EM Version: 1.3.0.4383

Grapevine Version: 1.3.0.14944.dev1017-ge97cc63



Last login: Thu Nov 3 21:36:13 2016 from 172.18.123.130

(grapevine)

[Sun Nov 13 21:27:00 UTC] grapevine@172.18.123.11 (grapevine-root-1) ~

# Links

---

<http://opensource.cisco.com/>

[Cisco Engineers Win Awards for Open Source Spam Filtering - Doing Business With Cisco](#)

[Cisco Open SDN Controller](#)

[Cisco Application-Centric Infrastructure \(ACI\) and Linux Containers](#)

[Linux Containers: Why They're in Your Future and What Has to Happen First](#)



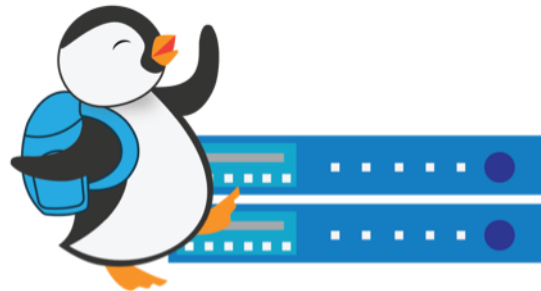


  
**CISCO**

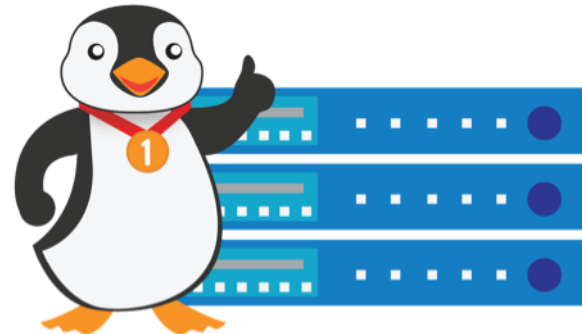
# NDG Linux Courses Offered to Cisco Networking Academies



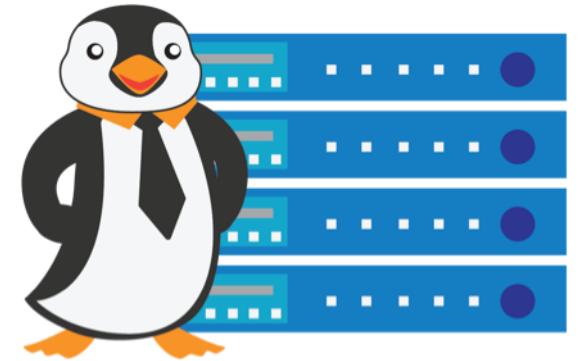
NDG Linux Unhatched



NDG Linux Essentials



NDG Linux 1



NDG Linux 2


# Economical

Course Title		Cost to Instructors	Cost to Students
NDG Linux Unhatched		FREE	FREE
NDG Linux Essentials		FREE	FREE
NDG Linux I		FREE	\$39.95*
NDG Linux II		FREE	\$39.95*


*\* Paid by the learning institution or the individual*

# Available in Networking Academy

Grace Sign Out English My NetAcad

 Cisco Networking Academy Courses Careers Get Started About Us


Home / Courses / NDG Introduction to Linux



## NDG Introduction to Linux

Learn basic Linux system administration skills and prepare for LPI LPIC-1 or CompTIA Linux+ powered by LPI certification.

[Enroll Now](#)



■ ■ ■ Intermediate Duration: 140 hours Fee: \$39.95 Self-paced / Instructor-led

## Course Summary

Developed by: [NDG](#)

**NDG Introduction to Linux** is a 2-course series for aspiring Linux system administrators. Develop proficiency in performing maintenance tasks on the command line, installing and configuring a computer running Linux, and configuring basic networking, using virtual machines running Linux.

- Introduction to Linux I, 70 hours, prepares you for certification Exam 101 and covers: system architecture, Linux installation and package management, GNU and UNIX commands, devices, Linux file systems, and file system hierarchy standards.
- Introduction to Linux II, 70 hours, prepares you for certification Exam 102 and covers: shells, scripting and data management, interfaces and desktops, administrative tasks, essential system services, networking fundamentals, and security.
- Develop a working knowledge of the Linux command line.
- Study with an instructor in the classroom or at your own pace. Access expert content online anytime.
- Get immediate feedback on your knowledge through built-in quizzes and tests.
- Connect with the global Cisco Networking Academy community.

Languages: English

[Enroll Now](#)

# Learn By Doing!

“I hear and I forget.

I see and I remember.

I do and I understand.”

Confucius



# Course Content with Virtual Machine

Content

Objectives

Key Terms

## 3.6 head Command

The purpose of the `head` command is to view the beginning of a file or output. By default, the `head` command will display the first ten lines of a file's contents. For example, the following command displays the first ten lines of the `alpha.txt` file:

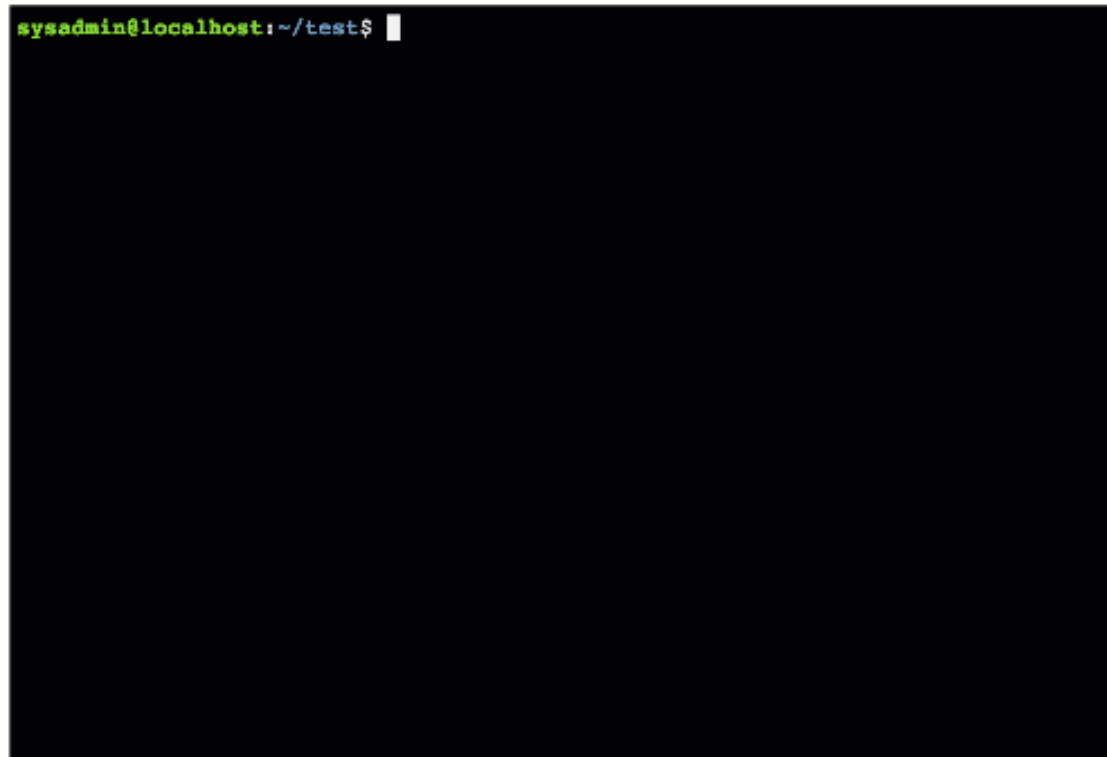
```
sysadmin@localhost:~/test$ head alpha.txt
A is for Apple
B is for Bear
C is for Cat
D is for Dog
E is for Elephant
F is for Flower
G is for Grapes
H is for Happy
I is for Ink
J is for Juice
```

There are several options for the `head` command that are useful. For instance, there is the ability to use a number as an option to indicate how many lines of output to display. For example, to display the first three lines of the `alpha.txt` file execute:

```
sysadmin@localhost:~/test$ head -3 alpha.txt
A is for Apple
B is for Bear
C is for Cat
```

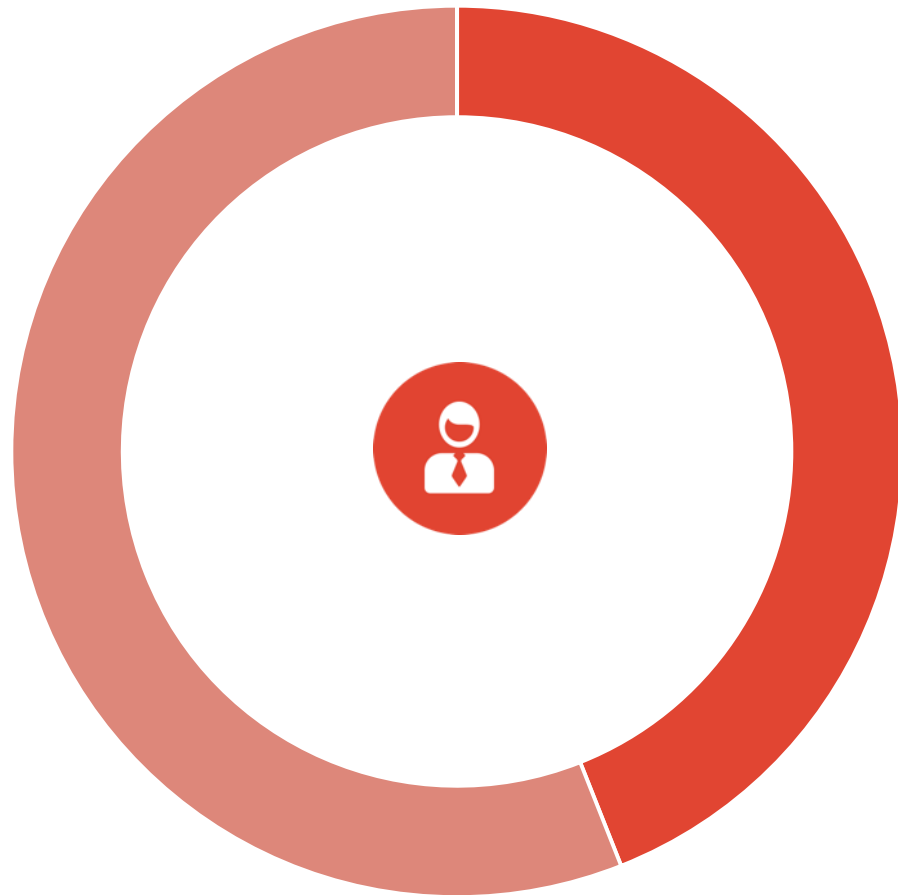
There is also an option, `-n`, which takes an argument for the number of lines to display. So, the

>\_ Ubuntu PC



```
sysadmin@localhost:~/test$
```

# Certifications Help Students Stand Out



**44%** of hiring managers are more likely to hire a candidate with Linux certification.

# Courses align to, LPI Linux Essentials, LPI LPIC-1 or CompTIA Linux+





# How To Access Linux Unhatched

**Website: [netacad.com/campaign/443092](https://netacad.com/campaign/443092)**

 Cisco Networking Academy

## Linux Unhatched

Establish basic knowledge that starts to build Linux expertise, a valuable skill needed for in-demand IT careers.



■ ■ ■ Beginning    Duration: 8 Hours

Self-paced

Thank you for participating in the Intro to Linux webinar series. If interested in enrolling in the free 8 hour “Linux Unhatched” course, please see the information below.

Course Summary

Sign Up Now

# How To Access

1. Go to <http://netacad.com>



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Build your skills today

Cisco Networking Academy is an IT skills and career building program for learning institutions and individuals worldwide.



# How To Access

## 2. Click **Courses**



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About Us ▼

Build your skills today

Cisco Networking Academy is an IT skills and career building program for learning institutions and individuals worldwide.



# How To Access

## 3. Choose Course

If you are not part of the Cisco Networking Academy, you can only enroll in Linux Essentials.

<h3>NDG Linux Unhatched</h3> <p>Establish basic knowledge that starts to build Linux expertise, a valuable skill needed for in-demand IT careers.</p> <p>■ ■ ■ Beginning</p>	<a href="#">Learn More</a> Self-paced
<h3>NDG Linux Essentials</h3> <p>Learn basic open source concepts and how to use the Linux operating system and command line.</p> <p>■ ■ ■ Beginning <a href="#">LPI Linux Essentials Professional Development</a></p>	<a href="#">Learn More</a> Instructor-led / Self-paced
<h3>NDG Linux I &amp; II</h3> <p>Learn Linux system administration skills and prepare for LPI LPIC-1 or CompTIA Linux+ powered by LPI certification.</p> <p>■ ■ ■ Intermediate <a href="#">CompTIA Linux+ Powered by LPI</a></p>	<a href="#">Learn More</a> Instructor-led / Self-paced

# How To Access

## 4. Click **Enroll Now**

[Courses](#) ▼ [Careers](#) ▼ [Get Started](#) ▼ [About Us](#) ▼

[Home](#) / [Courses](#) / [NDG Linux Essentials](#)

### NDG Linux Essentials

Learn the basics of Linux, the world's most popular operating system, and expand your career opportunities in IT.

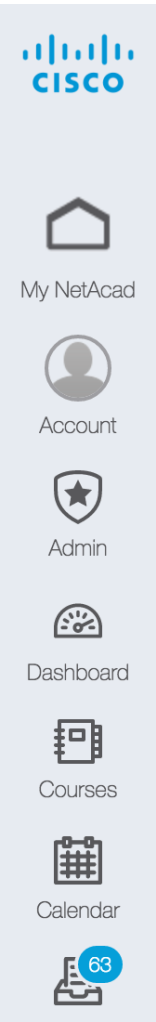
[Enroll Now](#)



# How To Access

If you are part of Cisco Networking Academy...

## 5. Click **Enroll in Course**



Enroll in NDG Linux Essentials - 08/16

You are enrolling in **NDG Linux Essentials - 08/16**

[View Privacy Policy](#) ↗



# How To Access

If you are **NOT** part of Cisco Networking Academy...

## 5. Fill out the **Sign Up Now** box.

■ ■ ■ Beginning Duration: 70 Hours

Self-paced

### Course Summary

NDG Linux Essentials is designed for learners who are beginning to build Linux knowledge for a career in IT. This is the self-paced course for students who are new to Cisco Networking Academy.

- Learn basic open source concepts.
- Understand how Linux is used and the basics of the command line.
- Apply skills using Linux virtual machine with step-by-step and hands-on lab activities.
- Build foundational knowledge for progressively mastering Linux commands.
- Connect with the global Cisco Networking Academy community.


Languages: English

After you sign up, check your email for a login to the Networking Academy web site and a link to your course.

### Tips for Accessing Networking Academy

- Recommended browsers: Mozilla Firefox, Google Chrome.
- If you don't receive your email, check your spam folder.
- If you still can't find it, add [noreply@netacad.com](mailto:noreply@netacad.com) to your safe sender list and resend activation email.
- If you are locked out after too many attempts, try again in 10 to 15 minutes.

### Sign Up Now

  
  
  
  
Text Verification \*

# For more info visit: [ndg.tech/linux1](https://ndg.tech/linux1)



## Linux System Administrator

Salary Range: \$41,000 to \$105,000



National Average: \$67,000

## Linux System Engineer

Salary Range: \$59,000 to \$118,000



National Average: \$89,018



## Network Administrator

Salary Range: \$48,000 to \$82,000



National Average: \$63,584

## Network Engineer

Salary Range: \$54,000 to \$108,000



National Average: \$73,165



## Support Technician

Salary Range: \$23,000 to \$51,000



National Average: \$36,337

## Support Engineer

Salary Range: \$43,000 to \$97,000



National Average: \$70,000



## DevOps Engineer

Salary Range: \$68,000 to \$142,000



National Average: \$100,000

## Cloud Engineer/Developer

Salary Range: \$50,000 to \$120,000



National Average: \$95,000



## Software Engineer

Salary Range: \$67,000 to \$132,000



National Average: \$95,195

## Software Developer

Salary Range: \$44,000 to \$127,000

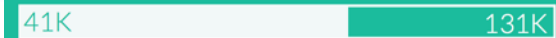


National Average: \$85,000



## IT Manager

Salary Range: \$41,000 to \$131,000



National Average: \$70,628

## IT Technician

Salary Range: \$23,000 to \$57,000



National Average: \$35,839





**Q&A: Linux is a core skill for all IT professionals.**



# Interested in Joining Cisco Networking Academy?

- Go to [netacad.com](https://netacad.com)
- Scroll Down to  
*Get Started*
- Click *Find an Academy*
- *Need Help?*  
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