In collaboration with 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

<table>
<thead>
<tr>
<th>Country</th>
<th>Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>76,594</td>
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<tr>
<td>USA</td>
<td>63,929</td>
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<td>India</td>
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<tr>
<td>Australia</td>
<td>1,255</td>
</tr>
<tr>
<td>Mexico</td>
<td>1,187</td>
</tr>
</tbody>
</table>
Companies That Use Linux

CISCO  
Microsoft  
UNITED STATES POSTAL SERVICE  
WIKIPEDIA  
NETFLIX  
DEPARTMENT OF DEFENSE  
GOOGLE  
IBM  
NASA  
AMAZON  
McDonald's  
SPACEX
Cisco ServiceGrid
Cisco Networking Academy – Linux in the Industry

Raoul Bhatia (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
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

Vendors
- Service Provider A
- Service Provider B
- ITSM Software A
- ITSM Software B

You
Hi! I’m Larry.

Managing Third Party Support

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

- MSP
- ISV
- OEM

Larry’s Company
Over Time The Service Ecosphere Grows...

Not scalable
Poorest visibility
High costs

Larry’s Company

CUST
MSP
MSP2
IT
CUST2
ISV
OEM
There Must Be a Better Way ....
ServiceGrid – Connect Once – Connect All!
ServiceGrid – Technical Details
How and where we are using Linux and Open Source technology.
Where Linux is used

- **(1) ServiceGrid User Interface**
- **(2) ServiceGrid Application Software**
  - Middleware
    - Load Balancer
    - Webserver
    - Application Server
    - Mail Server / SFTP Server
    - Database Server / JMS Server
    - Backup
- **(3) Operating System:** Debian GNU/Linux
- **(4) (Virtual) Server Hardware & Network**
- **(5) Datacenter & Cloud IaaS**

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- **ServiceGrid Customer**
- **Use Application Manage Data**
- **Support**
- **Application Development**
- **Open Source Technology** &
- **Linux**
- **Operation**

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Let’s Peek into the Data Center …
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.)
Linux on the Server
Examples of Open Source Software

- Debian GNU/Linux (Operating System)
- Nginx & Ildirectord (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 ;-)
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
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
Linux Rocks!
ServiceGrid Resources

cisco.com/go/servicegrid

YouTube ServiceGrid

@ ServiceGrid

CONTACT

Raoul Bhatia
Platform and Service Operations

Email: raobhati@cisco.com

LinkedIn: https://at.linkedin.com/in/raoulbhatia
Xing: 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
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
- Greenfield
- Expert CLI
- Programmable API
- Brownfield + Greenfield
- 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
NDG Linux Courses Offered to Cisco Networking Academies

- NDG Linux Unhatched
- NDG Linux Essentials
- NDG Linux 1
- NDG Linux 2
## Economical

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Cost to Instructors</th>
<th>Cost to Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDG Linux Unhatched</td>
<td>FREE</td>
<td>FREE</td>
</tr>
<tr>
<td>NDG Linux Essentials</td>
<td>FREE</td>
<td>FREE</td>
</tr>
<tr>
<td>NDG Linux I</td>
<td>FREE</td>
<td>$39.95*</td>
</tr>
<tr>
<td>NDG Linux II</td>
<td>FREE</td>
<td>$39.95*</td>
</tr>
</tbody>
</table>

*Paid by the learning institution or the individual student*
Available in Networking Academy
Learn By Doing!

“I hear and I forget.
I see and I remember.
I do and I understand.”

Confucius
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 following command displays the first three lines:

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

- **Linux Essentials**
  - LPI LE
  - More info
  - Entry Level
  - Certificate Program
  - 0-12 Months

- **LPIC 1**
  - LPI 101
  - LPI 102
  - More info
  - Junior Level
  - Professional Certification
  - 1-2 Years

- **LPIC 2**
  - LPI 201
  - LPI 202
  - More info
  - Advanced Level
  - Professional Certification
  - 2-3 Years

- **LPIC 3**
  - LPI 300
  - LPI 303
  - LPI 304
  - More info
  - Senior Level / Specialty Areas
  - Professional Certification
  - 3+ Years
How To Access Linux Unhatched

Website: netacad.com/campaign/443092
1. Go to [http://netacad.com](http://netacad.com)
2. Click **Courses**
How To Access

3. Choose Course

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

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

NDG Linux Essentials
Learn basic open source concepts and how to use the Linux operating system and command line.
- Beginning
- LPI Linux Essentials Professional Development
- Instructor-led / Self-paced

NDG Linux I & II
Learn Linux system administration skills and prepare for LPI LPIC-1 or CompTIA Linux+ powered by LPI certification.
- Intermediate
- CompTIA Linux+ Powered by LPI
- Instructor-led / Self-paced
4. Click **Enroll Now**

**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**
How To Access
If you are **NOT** part of Cisco Networking Academy...

5. Fill out the **Sign Up Now** box.
For more info visit: 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
• Scroll Down to Get Started
• Click Find an Academy
• Need Help? karsulli@cisco.com