# What are Linux-Based Routers?

Open Discussion on Linux Networking
Datto LUG
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# Aren't all Routers based on Linux?

- Yes, Sorta. Remember DD-WRT?
- Are router firmware based on linux?
- At the time of this writing there doesn't seem to be a definitive answer to this question, however here is my  definition of  “Linux-based” router.

# AIs Linux-Based Router(LBR) Definition

- As stated by AI, based on various resources: A linux-based router is  a networking device derived from a Linux OS distribution/kernel for use as on x86 hardware,specialized hardware or Linux-**derived** software suite.

- Right? .. Well sorta. Does the software on your router use an embedded system of some sort? Is it closed source(i.e Cisco, HP, etc). Can it be installed on x86 or other specialized hardware (i.e MIPS ,PPC, SPARC etc)

# LBR Examples

| | | | |
|---|---|---|---|
| LinkSys | Debian/Ubuntu | BSD-ish | FW-??? |
| DD-WRT | Vyatta | PfSense | Sophos |
| OpenWRT | VyOS | m0n0wall | SonicWall |
| FreeWRT | OS/VX | Quagga | Openwall |
| HyperWRT | EdgeOS | Bird | Endian |
| Tomato | Zentyal | MiroTik | |
| | Untangled | *Halon* | |

# Some LBR Hardware

- Cavium Networks
  - Octeon MIP64
- Broadcom
- Emulex
- Mellanox
- Juniper and OCP (OCX1100) <—wait thats a L3 switch right?
  - A rich set of Layer 3 features for IPv4 and IPv6 deployments,including BGP, OSPF, IS-IS, and BGP add path (see the Software Features section for a detailed list)

# Will LBRs and SDN work?

- What is SDN?
  - Software-defined networking (SDN) is a new approach to designing, building, and managing networks that separates the network's control (brains) and forwarding (muscle) planes to better optimize each. src: https://www.sdxcentral.com/resources/sdn/what-the-definition-of-software-defined-networking-sdn/
  - The physical separation of the network control plane from the forwarding plane, and where a control plane controls several devices. src: https://www.opennetworking.org/sdn-resources/sdn-definition
  - Software-defined networking (SDN) is an approach to networking in which control is decoupled from the physical infrastructure, allowing network administrators to support a network fabric across multi-vendor equipment. src: http://searchsdn.techtarget.com/definition/software-defined-networking-SDN

# Yes, with changes to the Linux Kernel

- There has been a lot of Linux Networking improvements within recent kernel releases thats seems to be aimed at improving the kernel for 10/25/40/100 Interfaces and potential LBR purposes
- v3.16
- v3.19
- v4.0
- Additionally, Ive noticed some Silicon Manufactures that normally bypass the Linux kernel, now modifying it for small business gains (i.e Cisco, Brocade,HP,Juniper, etc) in their various offerings

# Idk yet, more LBR Research Needed

- ASIC vs FPGA
  - vs SoC vs ASSP
    - Further SDN Recon
- vRouters
- “I’m not the only person pointing out the software routers are reaching unprecedented performance levels”. ~Gregg Ferraro Ethermind/PacketPushers