

View Our Resources

... Firm Turns to Aerohive for Reliability and Coverage ▾

The Controller-less Access Network Architecture ▾

BYOD and Beyond: How to Turn BYOD into Productivity ▾

View Our Resources

... and Beyond: How to Turn BYOD into Productivity ▾

The Next Generation Wireless LAN: Designed for BYOD & User Needs ▾

2012-2013 WLAN Buyer's Guide ▾

Architect F... Security, Re...

# The return of the network operating system (NOS)

Guest Column By Lee Doyle, principal analyst at Doyle Research, special to Network World  
January 14, 2013 05:31 PM ET

1 Comment Print

Like 1

Network World - Will there be a market for SDN network operating systems? The answer will be critical to the evolution of SDN standards and the development of applications that leverage SDN capabilities.

The SDN industry is split on this question. Many SDN proponents and vendors, including the Open Networking Foundation, Big Switch, ADARA and Vyatta (Brocade), believe the network operating system is a unique (and critical) component of the SDN architecture. Other leading network and IT providers, such as Cisco and VMware, disagree, saying their SDN and network virtualization offerings do not have a distinct network operating system.

## Cisco, others eyeing \$3.7 billion SDN market

The rise in popularity of software defined networks (SDN) has led to a resurgence of the use of the term "network operating system" or NOS. From an IT history perspective, the initial period of NOS popularity was in the 1990s when Novell's Netware, Banyan's VINES and Microsoft's LAN Manager battled for market leadership. These NOSes ran on standard server hardware and enabled PCs combined with local area networks (Ethernet) to become distributed systems running client/server applications (e.g., email, file sharing, directories, security, database and network management).

The NOS circa 2013 is typically described as the software (middleware) layer that provides the platform for SDN applications. It provides abstraction of the transport layer and network virtualization services, offering north-bound APIs that enable applications and orchestration systems to program the network and request services from it. The SDN NOS is synonymous with the control layer in most SDN architectural diagrams.

A classic definition of a SDN NOS is software (sold separately from switching or routing hardware) that runs on standard server hardware (e.g., x86) and offers APIs as a platform for SDN applications. Current examples of a NOS include OpenFlow with enhancements (e.g., from Big Switch, NEC, IBM, HP, etc.) and software from startups such as ADARA, LineRate, Midokura and Brocade/Vyatta.

Network incumbents such as Cisco with IOS/ONE and Juniper with JUNOS plus its SDN software, can be a considered a NOS, but are dependent on the underlying network infrastructure. The SDN market is in its very early stages and there is wide variety in the capabilities of these SDN "NOS" product offerings. One of the few topics that Cisco and VMware agree on with regards to SDN is that there is NO such thing as a SDN network operating system!

The key question is whether there will be an independent market for SDN NOSes along the lines of the traditional network OS a la Novell Netware. Or whether the capabilities of the SDN NOS will be incorporated in a defined SDN control layer that is tightly tied to a specific cloud or network hardware architecture. This question will impact the emergence of SDN standards (e.g., northbound APIs) and ability of ISVs to develop SDN applications. Ultimately, the marketplace will decide the benefits (and drawbacks) of the various SDN NOS technologies and whether or not the SDN NOS market will emerge as

The power to do more

2013 Net Revenue By Business

Business	Revenue
Financial Advisory	62%
Asset Management	38%

Stock Performance

Index	Value
S&P Financial Index	~200
Other Index	~100

Powered by the Intel Atom processor. Shop Now

## Latest News

- Rackspace follows in Facebook's footsteps, plans to build own servers
- iPhone 6 rumor rollout for the week ending Jan. 18
- VA deploying millions of sensors to track, well, everything
- FAQ: The business case for Microsoft Surface Pro laptop/tablets
- Samsung Galaxy S IV: What we (might) know so far

[View more Latest News](#)

## LAN & WAN White Papers

- The Riverbed Cascade Solution**  
With the relentless pace of growth in applications and services, your corporate network has become...
- Forrester - Application Visibility: The Root of Good Service Management**  
New service models, such as cloud computing, demand a closer examination of service management...
- Network Monitoring and Troubleshooting for Dummies**  
The Network Monitoring and Troubleshooting for Dummies Book introduces you to common network...

[View more LAN & WAN White Papers](#)

## Newsletter Sign-Up

Receive the latest news, reviews and trends on your favorite technology topics

- Wide Area Networking Alert
- Security Alert
- Network Architecture Alert
- Daily News Alert

[View all newsletters](#)

a significant component of the overall networking market.

1 **2** [Next >](#)

[1 Comment](#)

[Print](#)

[Like](#) 1

**FREE DOWNLOAD: 7 BYOD Policy Essentials (Network World)»**

### Most Read

- [Tony Fadell on the unique nature of Apple's design process](#)
- [Truth in IT job postings: What those want ads really mean](#)
- [RSA: How to steal encryption keys off hardware chips and smart cards](#)
- [2013 job watch: Top 11 metro areas for tech jobs](#)
- [Security Holy Grail anyone?](#)

### From CIO.com

- [2013 CES Show Floor Video Tour](#)
- [16 Most Anticipated Tech Products of 2013](#)
- [How to Revive a Stalled Job Search](#)
- [26 Cloud-Specific IT Certifications](#)

[Read more at CIO.com](#)

### From CSO Online

- [20-plus best FREE infosec tools](#)
- [Rogues gallery: 10 infamous hacks and hackers](#)
- [5 more tough security job interview questions](#)
- [7 deadly sins of cloud computing](#)

[Read the latest from CSO Online](#)

[Like](#)

Comments powered by [Our Commenting Network](#) | [Policies](#) | [Privacy](#)

### Add New Comment

[Login](#)



Type your comment here.

### Showing 1 comment

[Sort by newest first](#)



**returnofthemus**

With all major vendors attempting to own the stack, I certainly wouldn't want to rule it out.

01/15/2013 07:09 AM

[Like](#) [Reply](#)

[Subscribe by email](#) [RSS](#)

### Reactions



### Most Commented on Network World

[Major flaw in Java-based Spring Framework allows remote-code execution by attackers](#)

7 comments · 16 hours ago

['Rogue clouds' giving IT staffs nightmares](#)

7 comments · 1 day ago

[25 crazy and scary things the TSA has found on travelers](#)

6 comments · 2 days ago

[Carmen Ortiz defends her office's prosecution of Aaron Swartz](#)

[Terms of Service](#)

# REGISTER to ATTEND

NETWORK WORLD PRESENTS

## BYOD and Mobility Management

Taking Charge of Apps, Policy, Security and More

February 12, 2013 • Los Angeles, CA