



# Cisco Community Meet The Author

Network Programmability with Joe Clarke

Joe Clarke

Distinguished Engineer

May 21, 2020



## Welcome to the new “Meet Authors event”

Learn from the IT expert that literally wrote the books & content  
*“Learn more about the best practices and approaches to troubleshoot complex network problems”*



Meet  
Author



Learn the  
Story behind



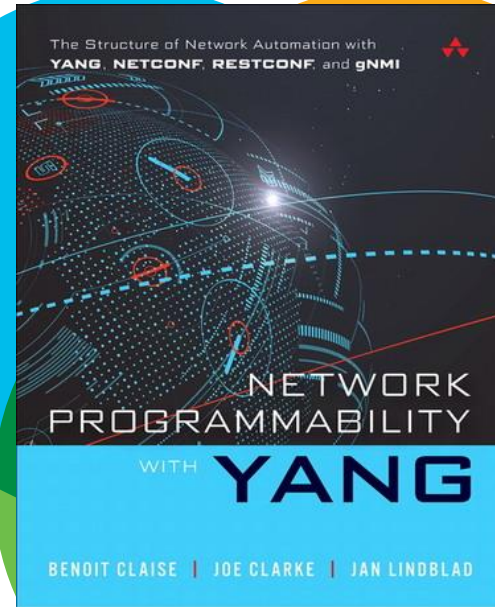
Trends &  
Key Content



Clarify  
Questions

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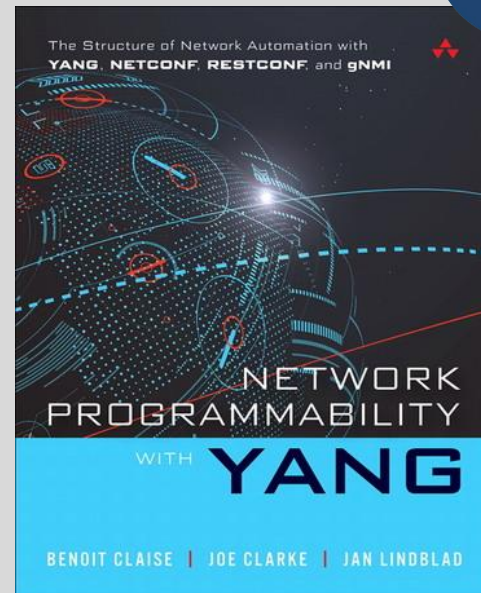
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# Meet the Author



**Joe Clarke**  
Distinguished Engineer



Distinguished Engineer, Speaker & Pearson author!

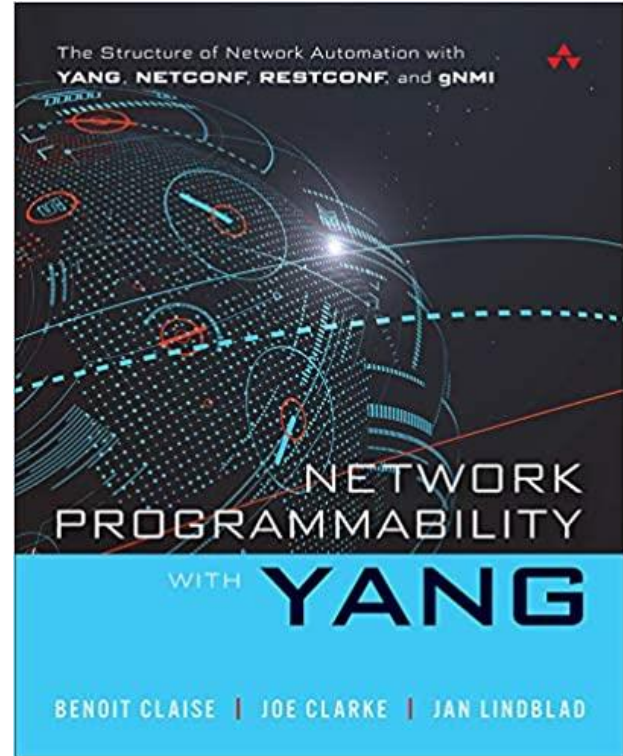
*It's Joe's time!*

*In the beginning there was SNMP  
and CLI*

...And they were good?

# Network Management Must Change

- Understand the “why” behind this shift to model-driven management and programmability
- Get to know YANG
- Dig into NETCONF, RESTCONF, and gNMI



*Automation is only as good as...*

Tools? Data Models? Metadata? YES.



# Go Beyond the Models

YANG Studio / NETCONF / YANG set "left-routing" / Modules

RPC Construction: YANG Set left-routing, Module(s) left-routing\_X, Load Module(s)

RPC Replays: NETCONF Operation edit-config, get-config, get

Options: Device (none selected), Database candidates, running, startup, RPC Reply Timeout in seconds, Build RPC, Clear RPCs, Edit RPC, Save RPC(s)

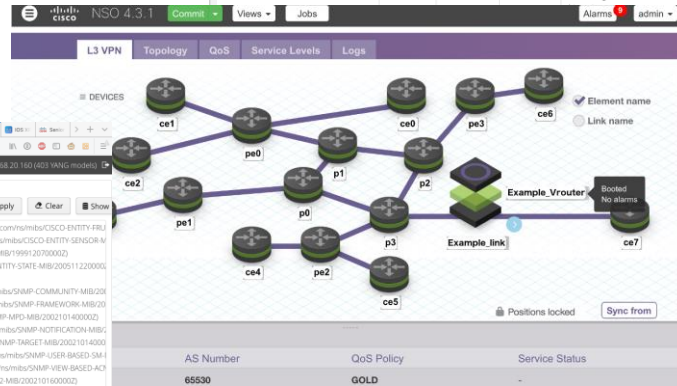
Nodes: left-routing, routing, router-id, interfaces, control-plane-protocols, ribs, name, address-family (rtipv4), default-rib, routes, active-route, routing-str

YANG DB Search Results for 'routes'

Show 10 entries

Search: industry standard Origin

Name	Revision	Schema Type	Path	Module	Origin	Organization	Maturity	Imported By # Modules	Compilation Status	Description
next-hop-content	2018-03-13	grouping	/rt/next-hop-content	left-routing	Industry Standard	ietf	ratified	2	passed	Generic parameters of next hops in static routes.
route	2018-03-13	list	/rt/routing/rt/control-plane-protocols/rt/static-routes/v6uripv6v6urroute	left-ipv6-unicast-routing	Industry Standard	ietf	ratified	2	failed	A list of static routes.
routes	2018-03-13	container	/rt/routing-state/rt/rib	left-routing	Industry Standard	ietf	ratified	2	passed	Current contents of the RIB.



Advanced Netconf Explorer

Start NETCONF console

Search modes, Search nodes, Apply, Clear, Show

Search results:

- CSCD-ENTITY-FRM-CONTROL-MIB
- CSCD-ENTITY-SENSOR-MIB
- ENTITY-MIB
- ENTITY-STATE-MIB
- RIM
- SNMP-COMMUNITY-MIB
- SNMP-FRAMEWORK-MIB
- SNMP-MPD-MIB
- SNMP-NOTIFICATION-MIB
- SNMP-TARGET-MIB
- SNMP-USG-BASED-SM-MIB
- SNMP-VIEW-BASED-ACM-MIB
- SNMPv2-MIB
- VM
- aaa
- aaa
- aaa

Paner Warnings:

- opencnfig-mpb@2015-11-05 yang failed to parse as a valid YANG model
- opencnfig-mpb@2015-11-05 yang tries to imports missing model: opencnfig
- opencnfig-mpb@2015-11-05 yang tries to imports missing model: opencnfig

GSM Subscribe: change 57400

# Become a Module Author

```
typedef ISBN-10-or-13 {
  type union {
    type string {
      length 10;
      pattern '[0-9]{9}[0-9X]';
    }
    type string {
      length 13;
      pattern '97[89][0-9]{10}';
    }
  }
  description
  "The International Standard Book Number (ISBN) is a unique
  numeric commercial book identifier.

  An ISBN is assigned to each edition and variation (except
  reprintings) of a book. [source: wikipedia]";
  reference
  "https://en.wikipedia.org/wiki/International_Standard_Book_Number";
}

grouping title-format-ref {
  leaf title {
    type leafref {
      path /books/book/title;
    }
  }
  leaf format {
    type leafref {
      path /books/book/title/format/format-id;
    }
  }
}

container authors {
  list author {
    key name;

    leaf name {
      type string;
    }
    leaf account-id {
      type uint32 {
        range 1001..max;
      }
    }
  }
}
```

```
$ netconf-console --get-config
<?xml version="1.0" encoding="UTF-8"?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="1">
  <data>
    <authors xmlns="http://example.com/ns/bookzone">
      <author>
        <name>Douglas Adams</name>
        <account-id>1010</account-id>
      </author>
      <author>
        <name>Malala Yousafzai</name>
        <account-id>1011</account-id>
      </author>
      <author>
        <name>Michael Ende</name>
        <account-id>1001</account-id>
      </author>
    </authors>
    <books xmlns="http://example.com/ns/bookzone">
      <book>
        <title>I Am Malala: The Girl Who Stood Up for Education and Was
        Shot by the Taliban</title>
        <author>Malala Yousafzai</author>
        <format>
          <isbn>9780297870913</isbn>
          <format-id>hardcover</format-id>
        </format>
      </book>
```

# Hear From the Experts

- Each chapter includes interviews from leading experts that helped shape model-driven management
- Learn how it began and where it's going

Russ White

Victor Kuarsing

Jürgen Schönwälder

Martin Björklund

Alex Clemm

Einar Nilsen-Nygaard

Radek Krejči

Kristian Larsson

Andy Bierman

Submit Your  
Questions Now!



Use the Q&A panel to submit your  
questions, our expert will respond.

# Extra Resources and References

## Cisco Press News

The new study CCNP and CCIE Enterprise Core ENCOR 350-401 Official Cert Guide Course is now available! [[Learn more](#)]

### Cisco Press -Cisco Certification Program Update

<http://www.ciscopress.com/promotions/new-cisco-certifications-142035>

- *Cisco CyberOps Associate CBROPS 200-201 Official Cert Guide*  
Omar Santos • ISBN 9780136807834 • August 2020\*\*
- *Cisco Certified DevNet Associate DEVASC 200-901 Official Cert Guide*  
Ashutosh Malegaonkar, Jason Gooley, Chris Jackson, Adrian Iliesiu • ISBN 9780136642961 • July 2020\*\*

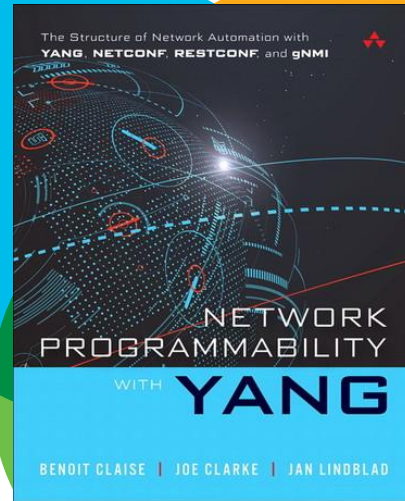
### Cisco Enterprise Presents at Tech Field Day Extra at Cisco Live Europe 2020

<https://techfieldday.com/appearance/cisco-enterprise-presents-at-tech-field-day-extra-at-cisco-live-europe-2020/>

### Joe's publications

<https://www.informit.com/authors/bio/37389BB7-558E-4EB5-9D2C-3AD6F9B7405E>

Congratulations  
winner!



We'll contact you via email

# Thank you for Your Time!

Please help to complete the survey

Your opinion is important and help us to improve



*Thanks For Joining today!*



