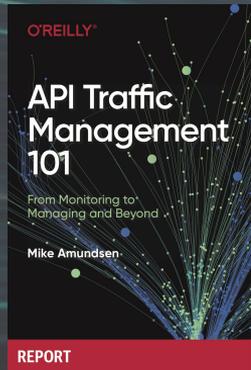


# Speeding the Future of APIs

*Meeting the real-time imperative  
of enterprise APIs*



@mamund

Mike Amundsen

API Strategy Advisor for Mulesoft

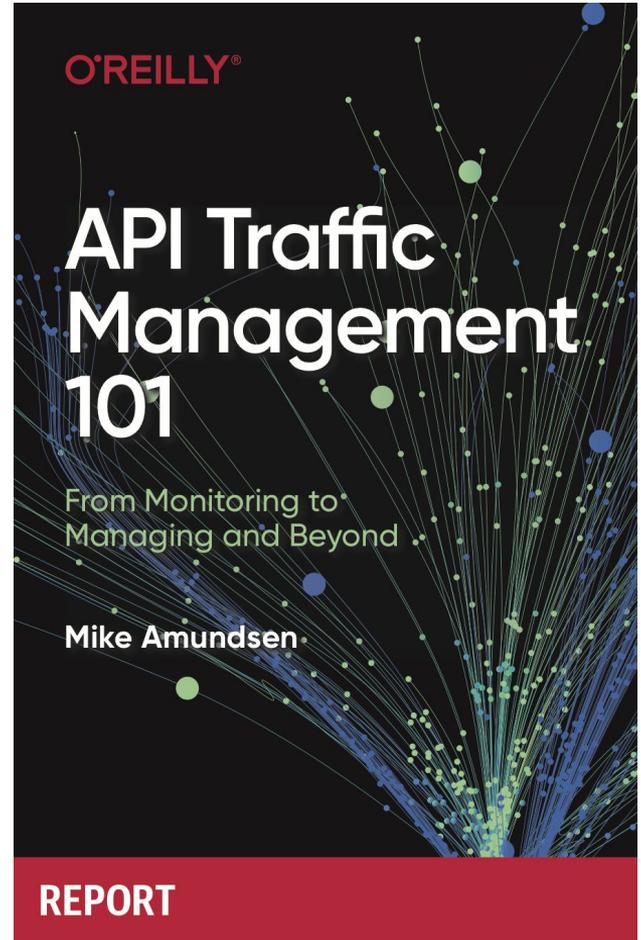
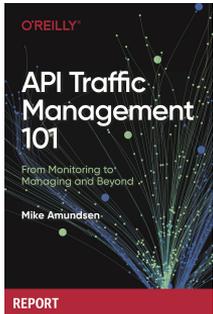
[youtube.com/mamund](https://youtube.com/mamund)

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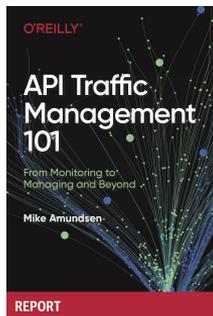
**Mike Amundsen**  
**@mamund**

*"Designed to provide you important insight into patterns and trends as well as pointers to specific tools and practices that you can use to build up your own experience and grow an API traffic management practice in your own company."*



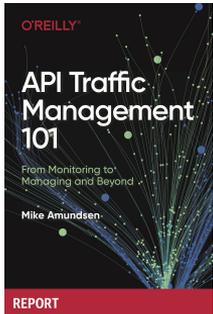
# Overview

- The Performance Imperative
- Architecting for Performance
- Monitoring for Performance
- Managing for Performance



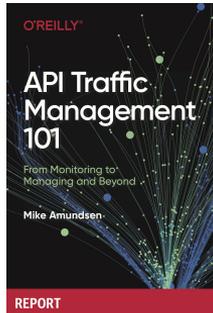


# The Performance Imperative



# The Performance Imperative

- Ecosystem Transformation
- API Call Volume
- Transaction Response Time



## APIs are at the core of modern enterprises

75%

of organizations will be completely digitally transformed in the next decade. Those that do not transform will not survive \*

By 2022

90%

of all new apps will feature microservices architecture; 35% of all production apps will be cloud native \*\*

APIs have a central role in both enabling the digital business and powering modern, microservices-based application architectures.

No organization can afford to ignore the pivotal role APIs hold in application and business modernization. Organizations that do not bring APIs at the core of their IT strategy will face substantial challenges to transform their technology and business foundations.



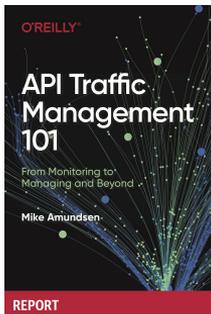
ANALYZE  
THE  
FUTURE

\*2019 IDC MaturityScape: Digital Transformation 1.0 \*\*2019 IDC Futurescape

IDC #EUR145216019

3

An IDC InfoBrief, Sponsored by NGINX

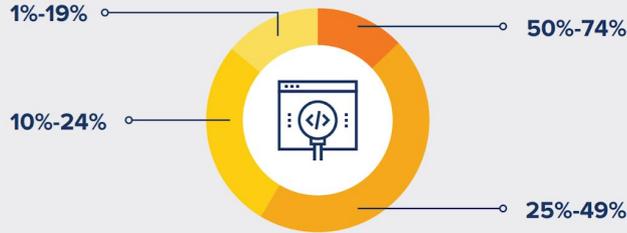


# Acceleration in API Call Volumes Requires the Right Level of Management

**71%** of organizations expect to see the volume of API calls increase in the next 2 years.

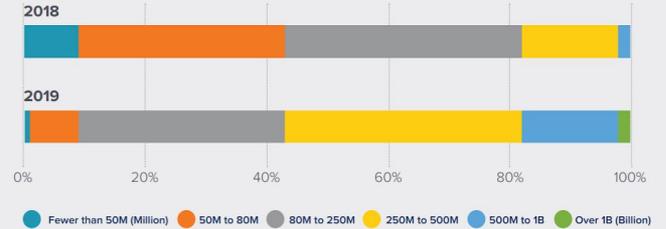


## Expected increase in the volume of API calls:



Q. By how much will the number of API calls increase 2 years from now?

Q. Please estimate the number of total API calls on a monthly basis, today and 1 year ago?



As the volume of API calls is clearly growing, enterprises need to plan their **API load balancing and traffic management** position accordingly.

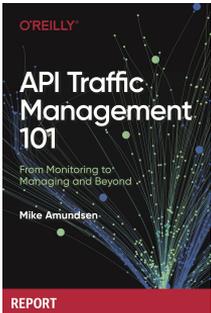
## Top API Management components organizations will invest in over the next year



**46%** Management and monitoring of API



**36%** API traffic management



# Performance is Critical for Successful API Programs

**59%**

of organizations expect a latency of

**under 20  
milliseconds**

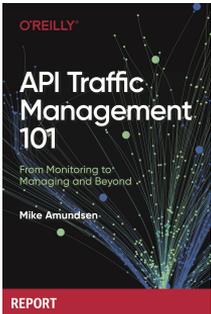
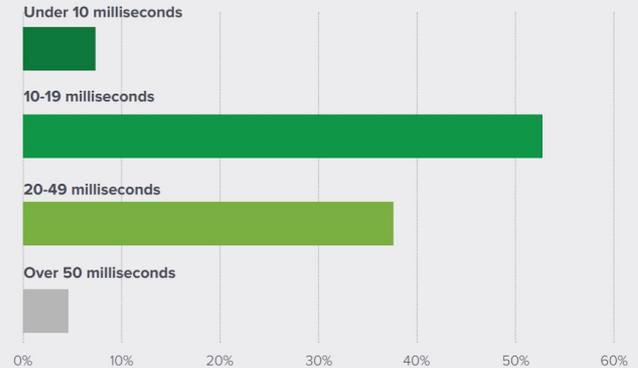
**93%**

of organizations expect a latency of

**under 50  
milliseconds**

At enterprise volume and scale, ensuring the adequate mechanisms to manage and ensure performance is very important. Poor performance results in APIs not being adopted by API customers, which cascades into failed business opportunities and poor ROI.

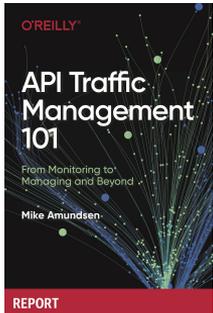
**Q. Please indicate your performance expectations per average API call**



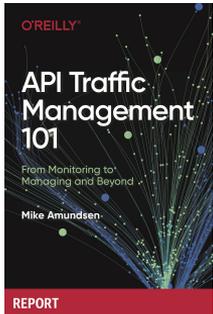
# The Performance Imperative



- Transformation
  - 90% of companies will need to support microservice architectures
- Volume
  - Over 80% of respondents expected 250mil calls/month
- Response Time
  - About 60% of calls need to be within 20 ms

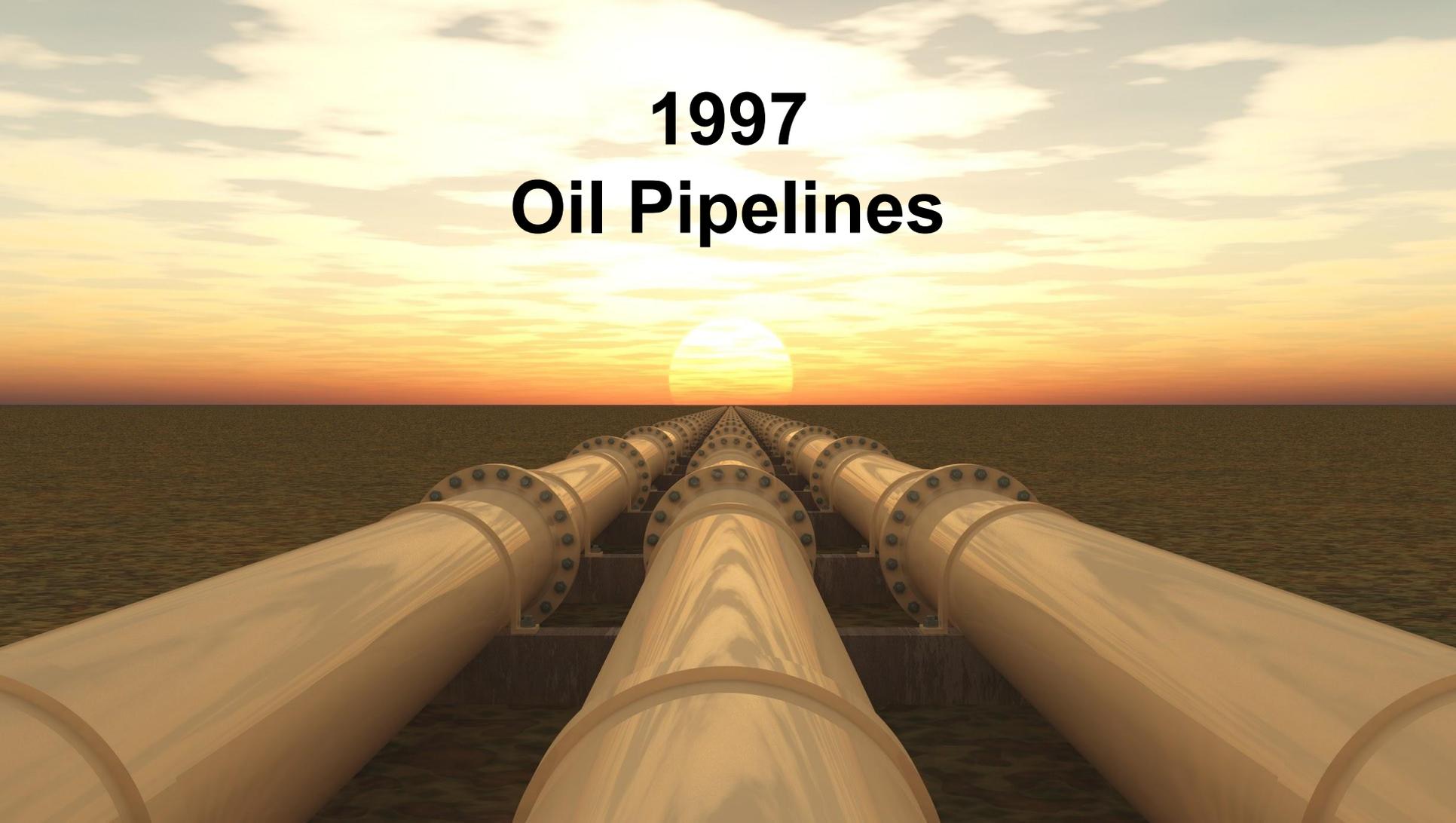


*How do we meet these new demands?*



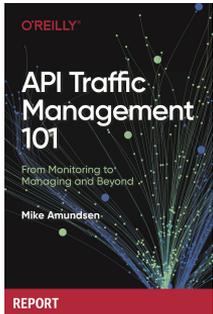
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# 1997 Oil Pipelines



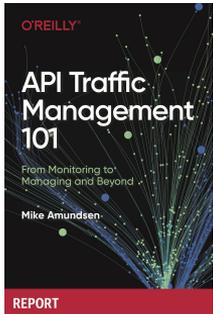
*"It was originally invented for  
real-time liquid pipeline control  
systems."*

*-- Arlen Nipper, Cirrus Link*

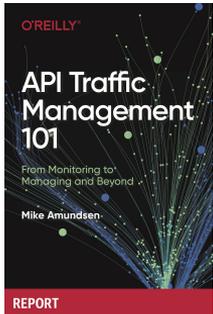


*" I really only foresaw that it would  
be useful in the SCADA world."*

*-- Andy Stanford-Clark, IBM*

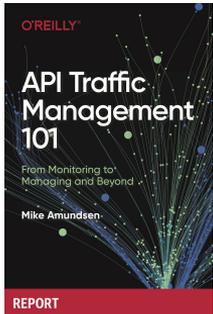


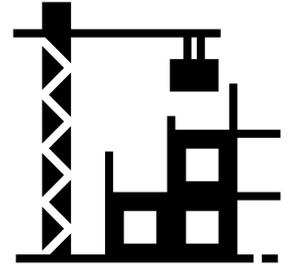
*The goal was was bandwidth-efficient, lightweight and uses little battery power because the devices were connected via satellite link which, at that time, was extremely expensive.*



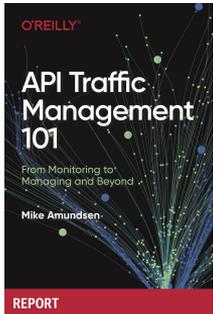
# MQTT

*The goal was was bandwidth-efficient, lightweight and uses little battery power because the devices were connected via satellite link which, at that time, was extremely expensive.*





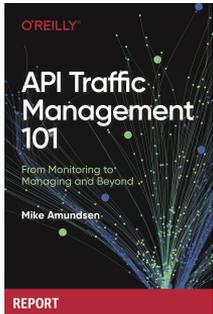
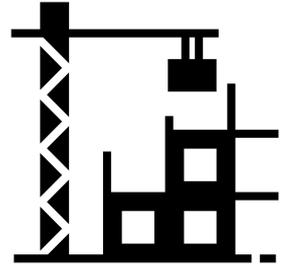
# Architecting for Performance



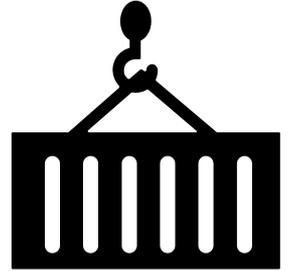
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# Architecting for Performance

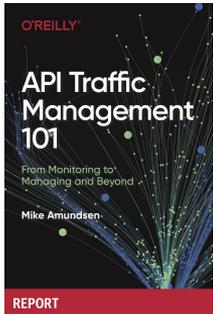
- Lift-and-Shift is not enough
- Redesigning Services
- Re-engineering Data
- Rethinking the Network



# Architecting for Performance

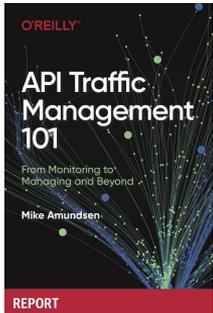


- Lift-and-Shift is not enough
  - Simply copying your on-prem to the cloud has limits
  - Adding distance & connections slows performance
  - Native storage and services operate under different rules
- Redesigning Services
- Re-engineering Data
- Rethinking the Network



# Architecting for Performance

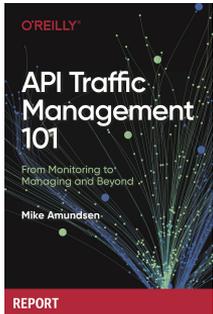
- Lift-and-Shift is not enough
- Redesigning Services
  - Make services smaller
  - Reduce wait states (async)
  - Build-in reversal and recovery
- Re-engineering Data
- Rethinking the Network



# Architecting for Performance

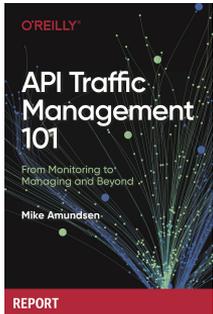
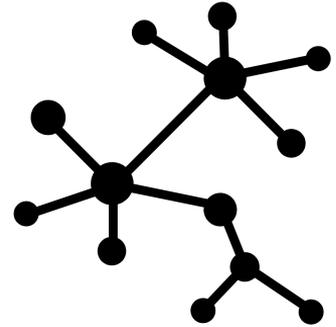


- Lift-and-Shift is not enough
- Redesigning Services
- Re-engineering Data
  - Cache results
  - Stage copies
  - Stream writes
- Rethinking the Network



# Architecting for Performance

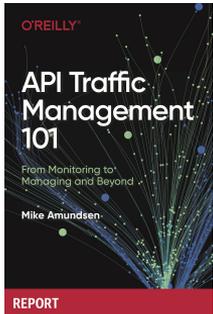
- Lift-and-Shift is not enough
- Redesigning Services
- Re-engineering Data
- Rethinking the Network
  - Decrease message size
  - Increase message volume
  - The return of RPC





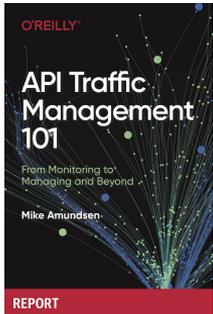
2008  
Summer Cottages

# Computer Whiz Creates a Twitter House



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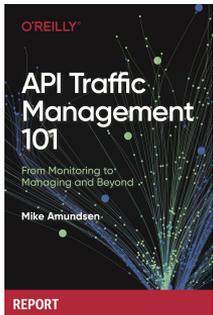
# Andy's Twitter House on the Isle of Wight

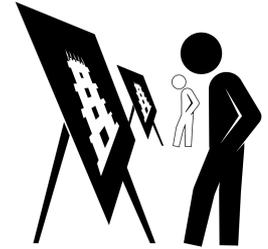


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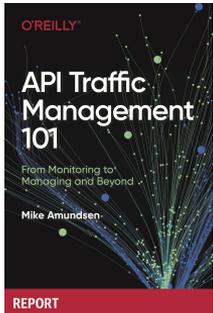
*"Like millions of people, this house uses the Twitter messaging service."*

*-- Andy Stanford-Clark, IBM*



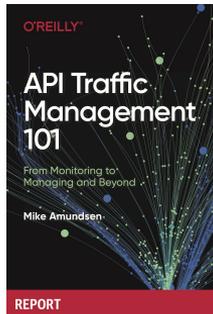


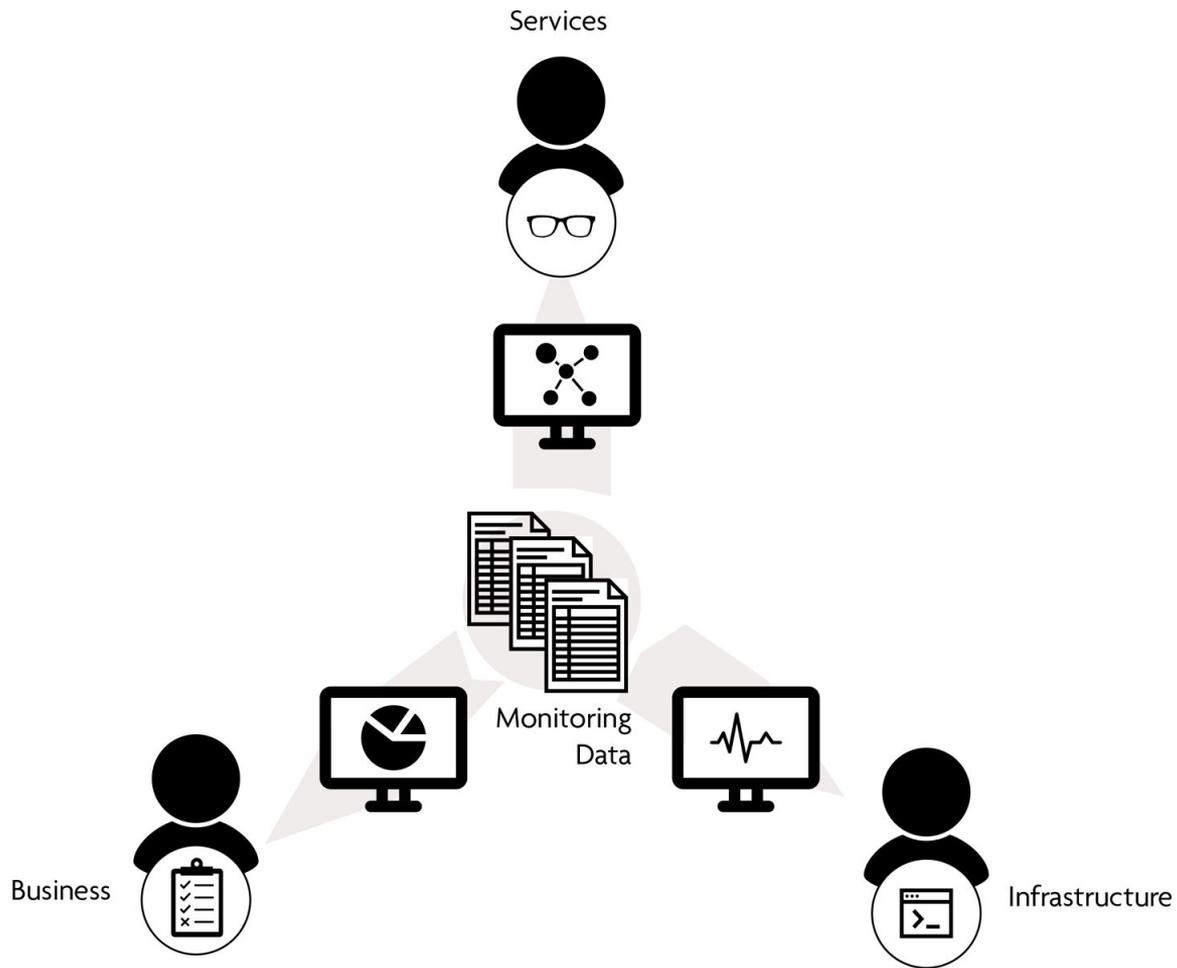
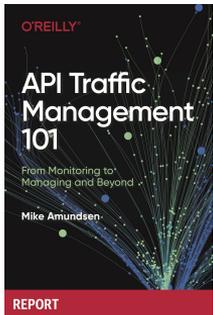
# Monitoring for Performance



# Monitoring for Performance

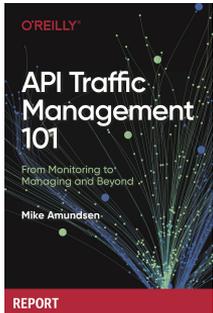
- Infrastructure
- Services
- Business





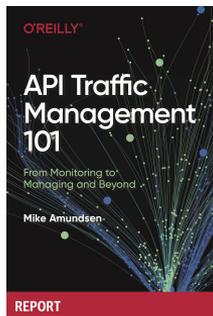
# Monitoring for Performance

- Infrastructure
  - Machines and network connections
  - CPU, memory, bandwidth, saturation
- Services
- Business



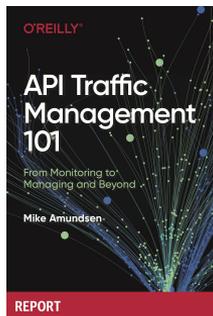
# Monitoring for Performance

- Infrastructure
- Services
  - Microservices, ESBs, etc.
  - Latency, error rates, limits, etc.
- Business

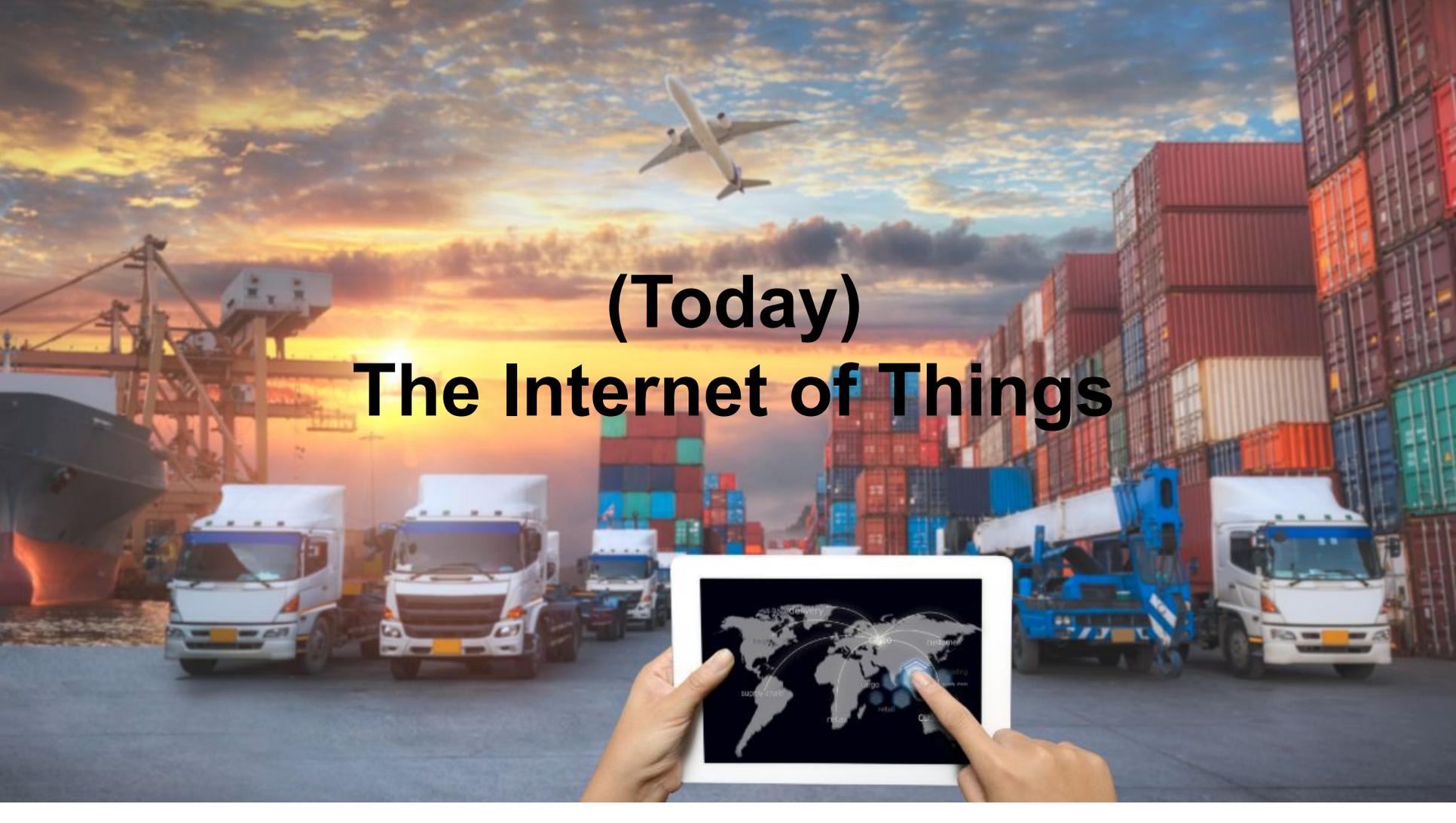


# Monitoring for Performance

- Infrastructure
- Services
- Business
  - Users, transactions, etc.
  - Completed orders, new signups, etc.

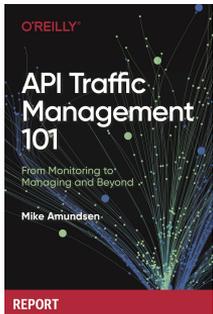
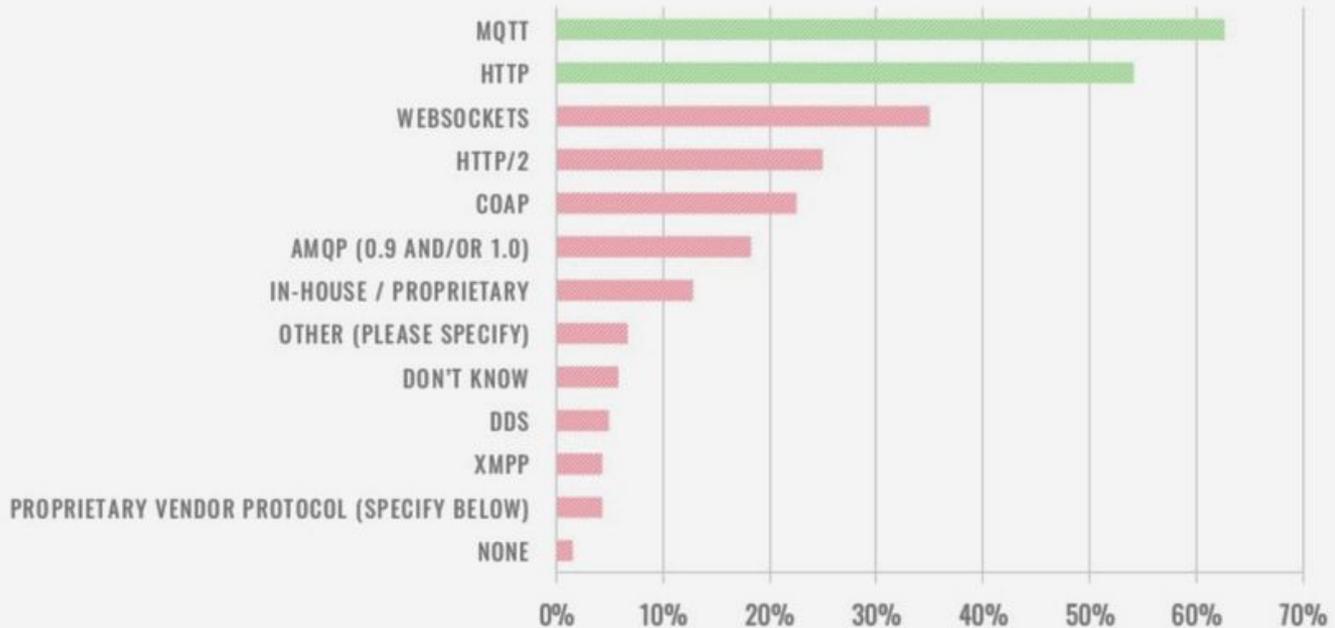


# (Today) The Internet of Things



# MESSAGING STANDARDS

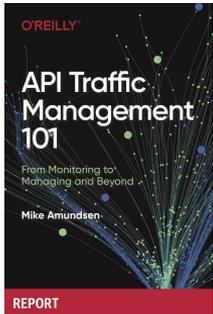
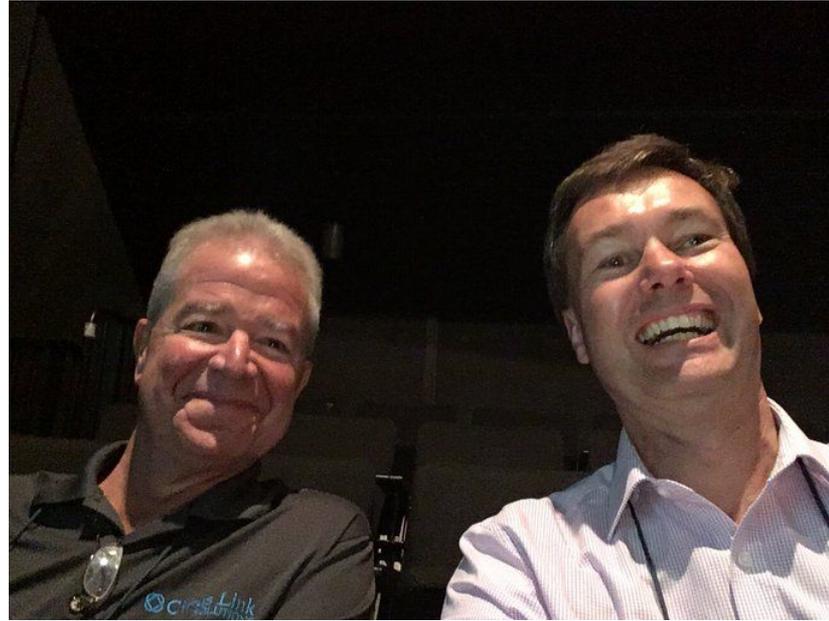
*What messaging protocol(s) do you use for your IoT solution?*



<https://www.controleng.com/articles/mqtts-role-as-an-iot-message-transport/>

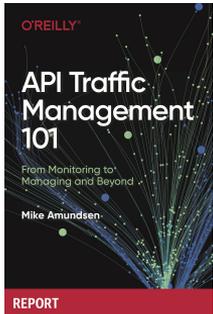
*"We're moving towards an Internet of Things where thousands, millions, trillions of devices, maybe, will be connected to the internet, each telling us about one little piece of data."*

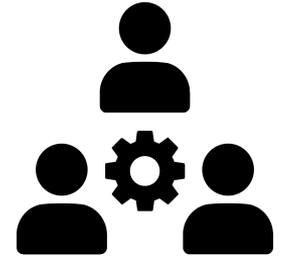
*-- Andy Stanford-Clark, IBM*



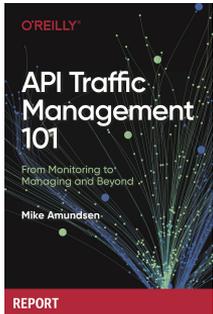
*"By mining that sea of data we can make information and knowledge about the world that we're in."*

*-- Andy Stanford-Clark*





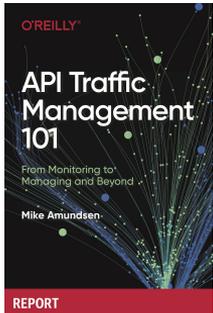
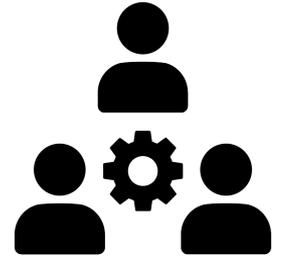
# Managing for Performance



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# Managing for Performance

- Insight
- Solving Problems
- Anticipating Needs

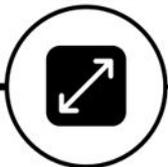




Monitor  
Requests



Control  
Access



Scale  
Services



Diagnose  
Errors



Recover  
From  
Failure



Experiment  
with the  
System

Insight

Solve Problems

Anticipate

## API Traffic Management 101

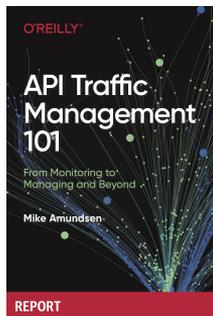
From Monitoring to  
Managing and Beyond

Mike Amundsen

REPORT

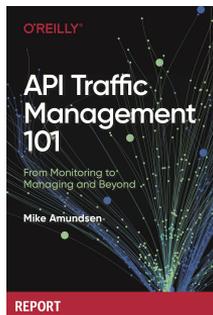
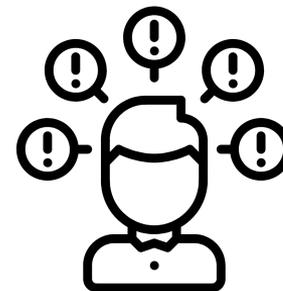
# Managing for Performance

- Insights
  - Monitor traffic
  - Monitor builds
- Solving Problems
- Anticipating Needs



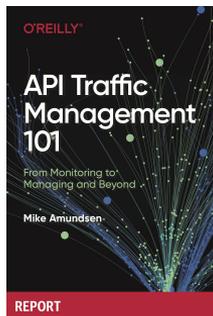
# Managing for Performance

- Insights
- Solving Problems
  - Security Watch
  - Scaling Services
  - Diagnosing Errors
- Anticipating Needs

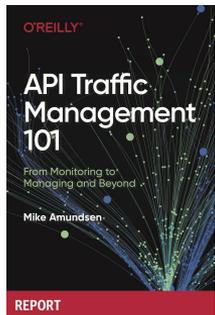


# Managing for Performance

- Insights
- Solving Problems
- Anticipating Needs
  - Automating Recovery
  - Running Experiments



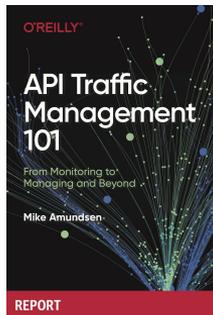
*And So...*



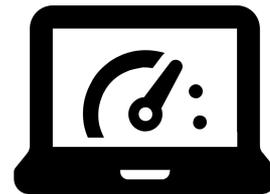
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# Overview

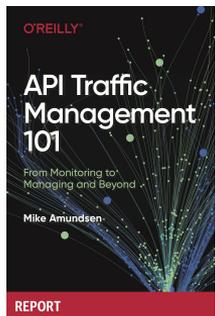
- The Performance Imperative
- Architecting for Performance
- Monitoring for Performance
- Managing for Performance



# Overview

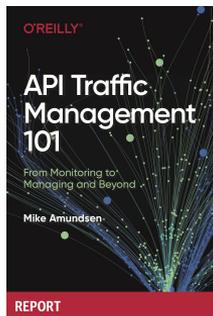
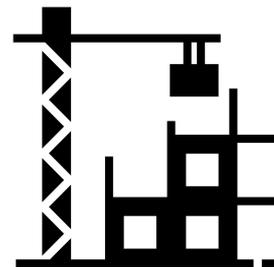


- The Performance Imperative
  - Prepare for call volumes to go up and transaction time to go down
- Architecting for Performance
- Monitoring for Performance
- Managing for Performance



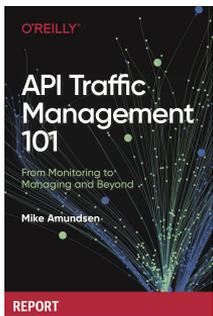
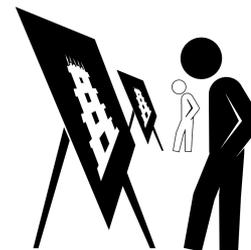
# Overview

- The Performance Imperative
- Architecting for Performance
  - Redesign services, re-engineer data, rethink networks
- Monitoring for Performance
- Managing for Performance



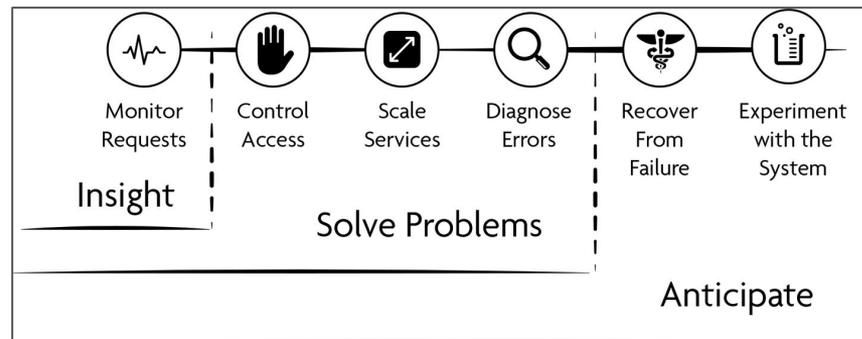
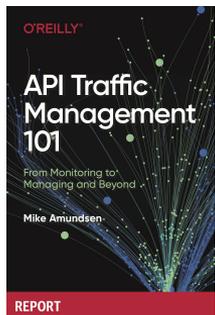
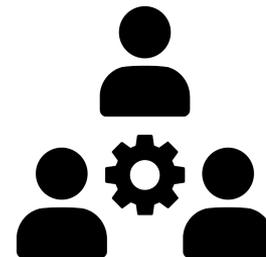
# Overview

- The Performance Imperative
- Architecting for Performance
- Monitoring for Performance
  - Monitor infrastructure, services, and your business metrics
- Managing for Performance



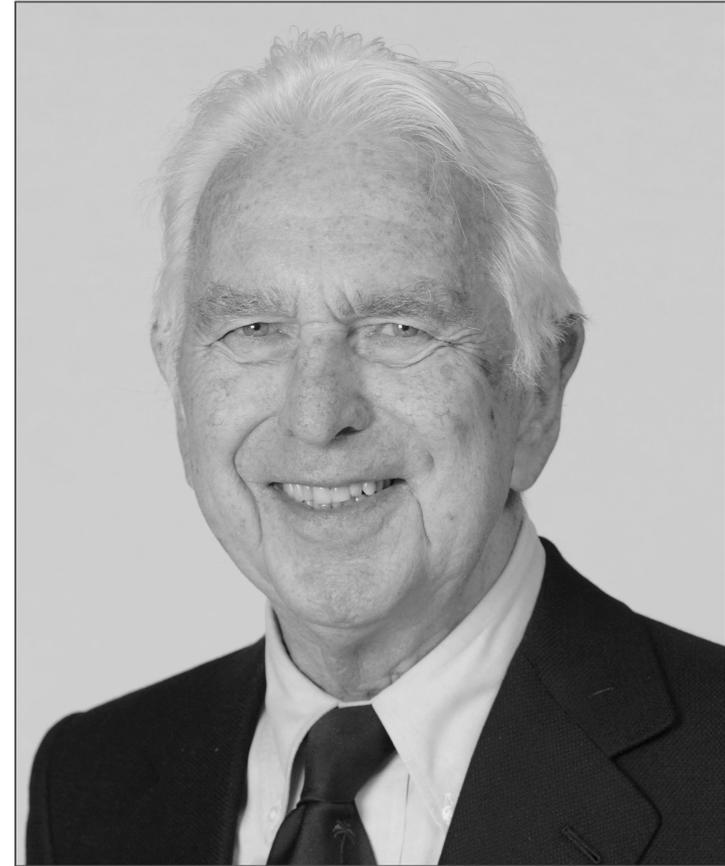
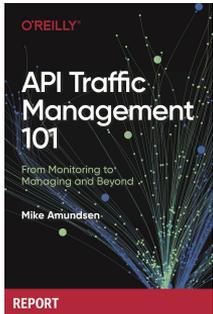
# Overview

- The Performance Imperative
- Architecting for Performance
- Monitoring for Performance
- Managing for Performance
  - Manage traffic, resolve problems, and anticipate needs

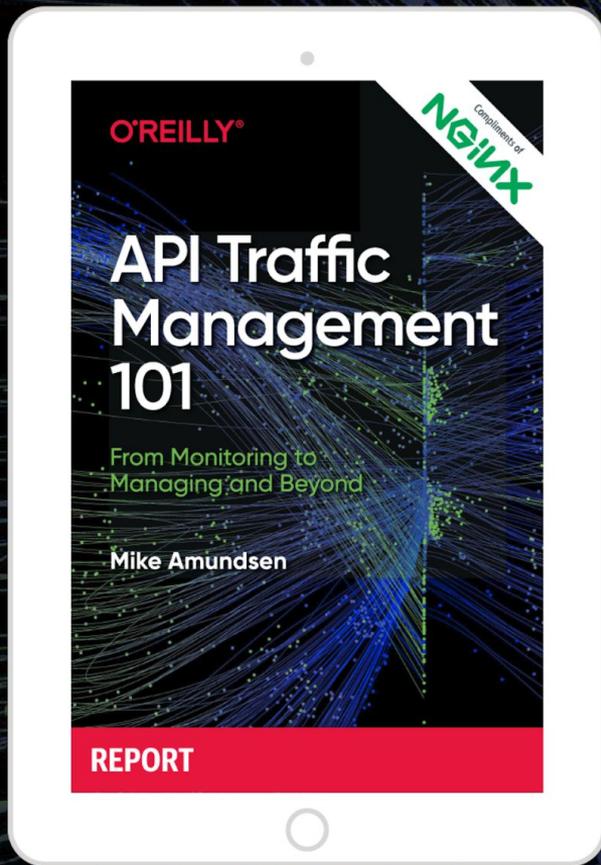


***"In life, change is inevitable. In business, change is vital."***

*-- Warren G. Bennis  
On Becoming a Leader (1989)*



<http://g.mamund.com/api-traffic>



EBOOK

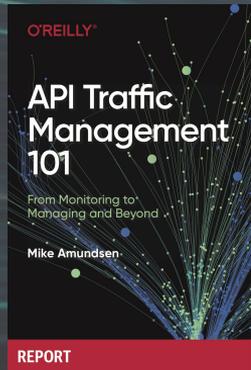
## API Traffic Management 101: From Monitoring to Managing and Beyond

Mike Amundsen introduces developers and network administrators to the basic concepts and challenges of monitoring and managing API traffic.

[DOWNLOAD FOR FREE](#)

# Speeding the Future of APIs

*Meeting the real-time imperative  
of enterprise APIs*



@mamund

Mike Amundsen

API Strategy Advisor for Mulesoft

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