Fast Lane: Where Code (Apple) Meets Network Infrastructure (Cisco)

Cisco DevNet Webinar Series

Speaker: Ashutosh Malegaonkar | Cisco DevNet
Hostess: Kara Sullivan | Cisco Networking Academy

30 November 2017

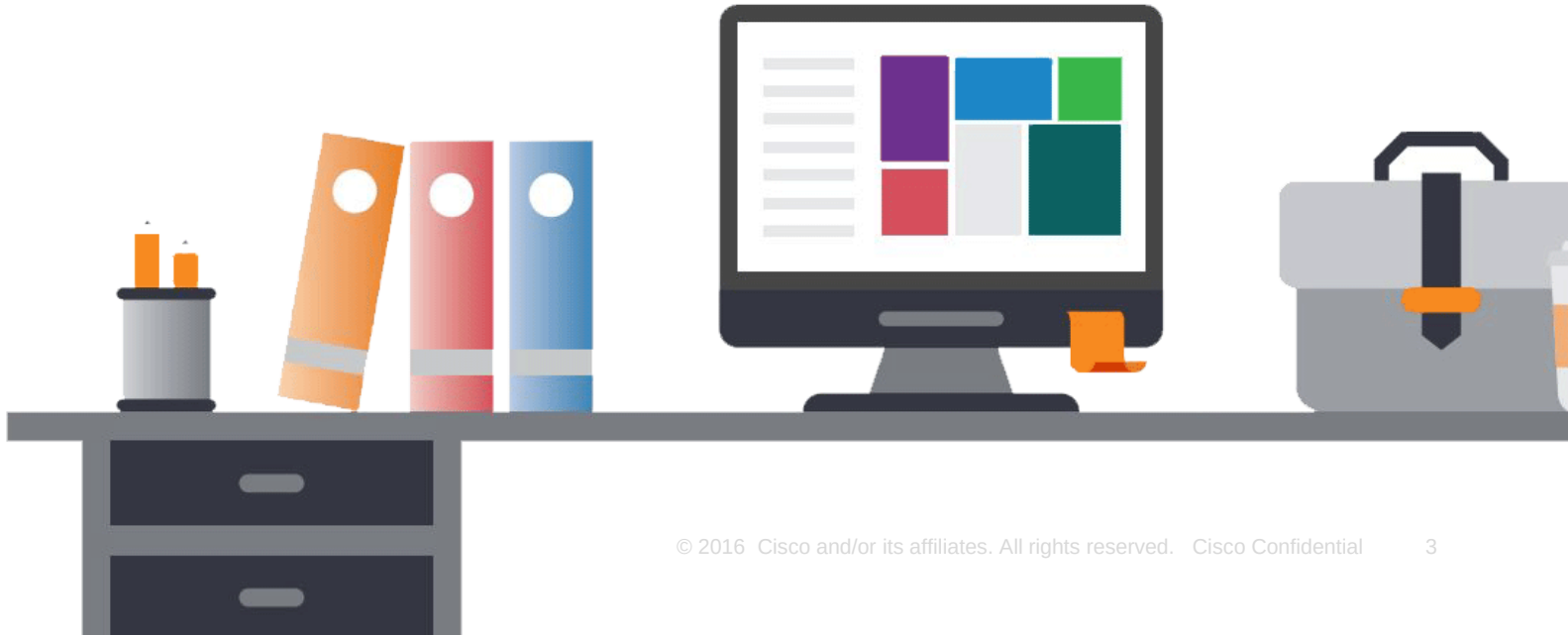
Welcome to the 4th session of the Cisco DevNet webinar series

- 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.

Before We Get Started

Today's Presentation:

- Difficulty Level: Medium
- Recommended Background: CCNA 1 with Coding



Cisco DevNet Series

1. Intro to Software & Programmability (Available On-Demand)
2. Intro to Coding (Available On-Demand)
3. Intent Networks (Available On-Demand)
4. Fast Lane: Where Code (Apple) Meets Network Infrastructure (Cisco) – Today!
5. **APIs with Cisco Spark – 14 December, 9:00 a.m. PST**

   Register @ http://bit.ly/APIsWithSpark

All Series Details can be Found @ http://bit.ly/DevNetSeries

Where Code (Apple) Meets Network Infrastructure (Cisco)

Cisco DevNet Series: Fast Lane

Ashutosh Malegaonkar
Cisco DevNet
November 2017

Agenda

- Digital transformation driving programmable networks
- Fast lane technology overview
  - Quick overview of QoS
  - Fast lane Technology and demo
- DevNet Fast lane validation labs
- Summary and Opportunities

Personal Transformation

My Personal Transformation

Device Drivers – Embedded Systems

Voice and Video Stacks (Middleware)

Web and Cloud Applications

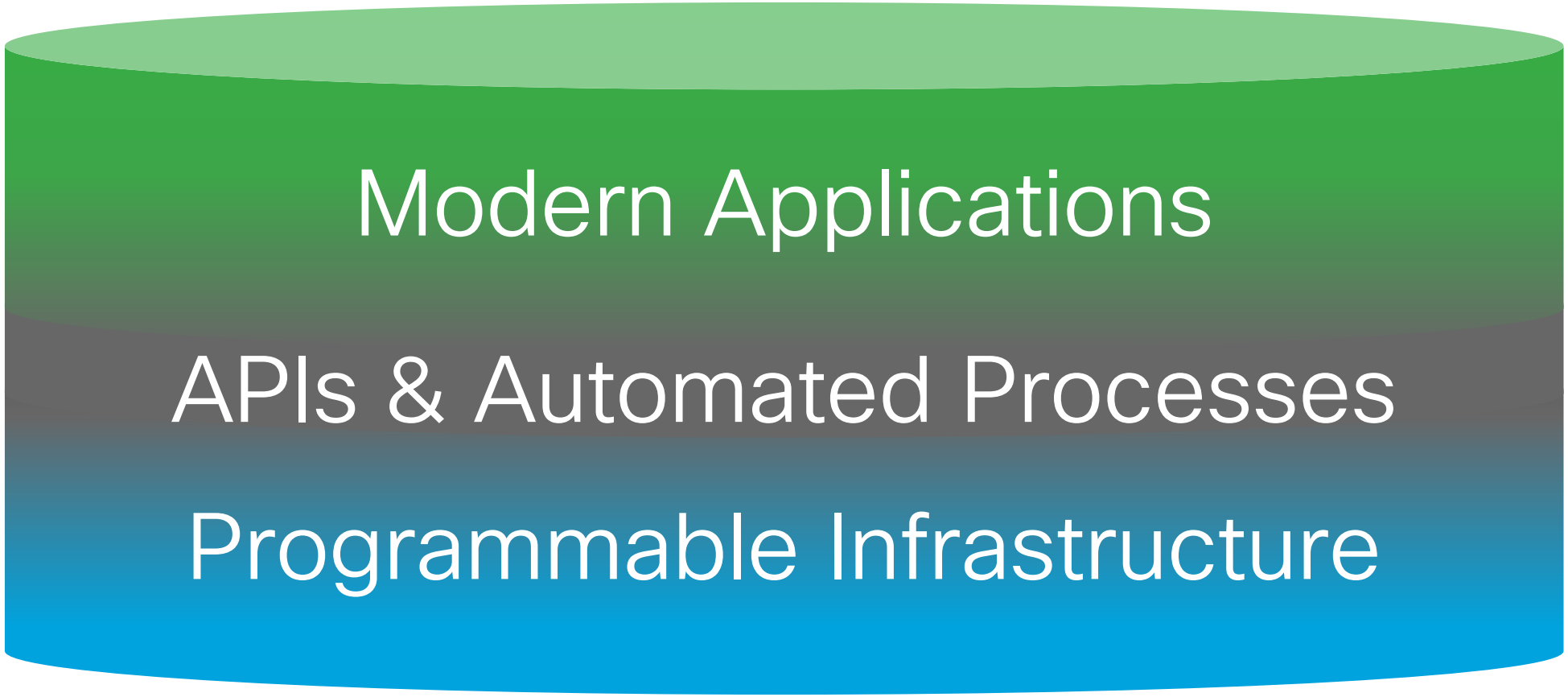
"Every next level of your life will demand a different *version* of you. Keep Re-Inventing Yourself"

amalegaonkar

Digital Transformation and Programmable Networks

Digital transformation needs an integrated approach

Where modern apps meet programmable infrastructure



Modern Applications

Network Performance

Location Based Services

Security

NetDevOps

Multi Cloud

Network Performance

How can one guarantee the quality of the modern app performance?

Quality Performance Use Cases

Stadiums

Live Updates

Smart Check-in

1

Healthcare

Doctor Staff communications

Reporting

2

Retail Augmented Reality

Smart shopping

3

Casinos

High touch gaming

4

Kiosks

Point of Sale Machines

Info Kiosks

5

Typical Healthcare Environment

Customer Example

- Hospitals provide Public Wi-Fi and need to operate business critical apps with top performance

Key Business Challenges

- Doctors, Nurses, Clinicians require to communicate with each other and the patient devices
- Little user intervention required to gain access
- Seamless and consistent experience on any device and any location

Retail Environment

Customer Example

- Retailer provide Public Wi-Fi and need to operate business critical apps with top performance

Key Business Challenges

- Retailers are looking to provide new experiences to shoppers who can do comparative shopping etc
- Seamless and consistent experience on any device and any location

What is Fast Lane?

What is Fast Lane

Fast lane enables business applications running on Apple iOS devices to prioritize their traffic [Quality of Service (QoS)] when used on Cisco Wi-Fi networks

Quality of Service Refresher (QoS)

Quality of Service (QoS)

"QoS mechanisms are designed to provide specific applications with guaranteed or consistent service in the absence of optimal bandwidth conditions"

There are three key methodologies for implementing QoS:

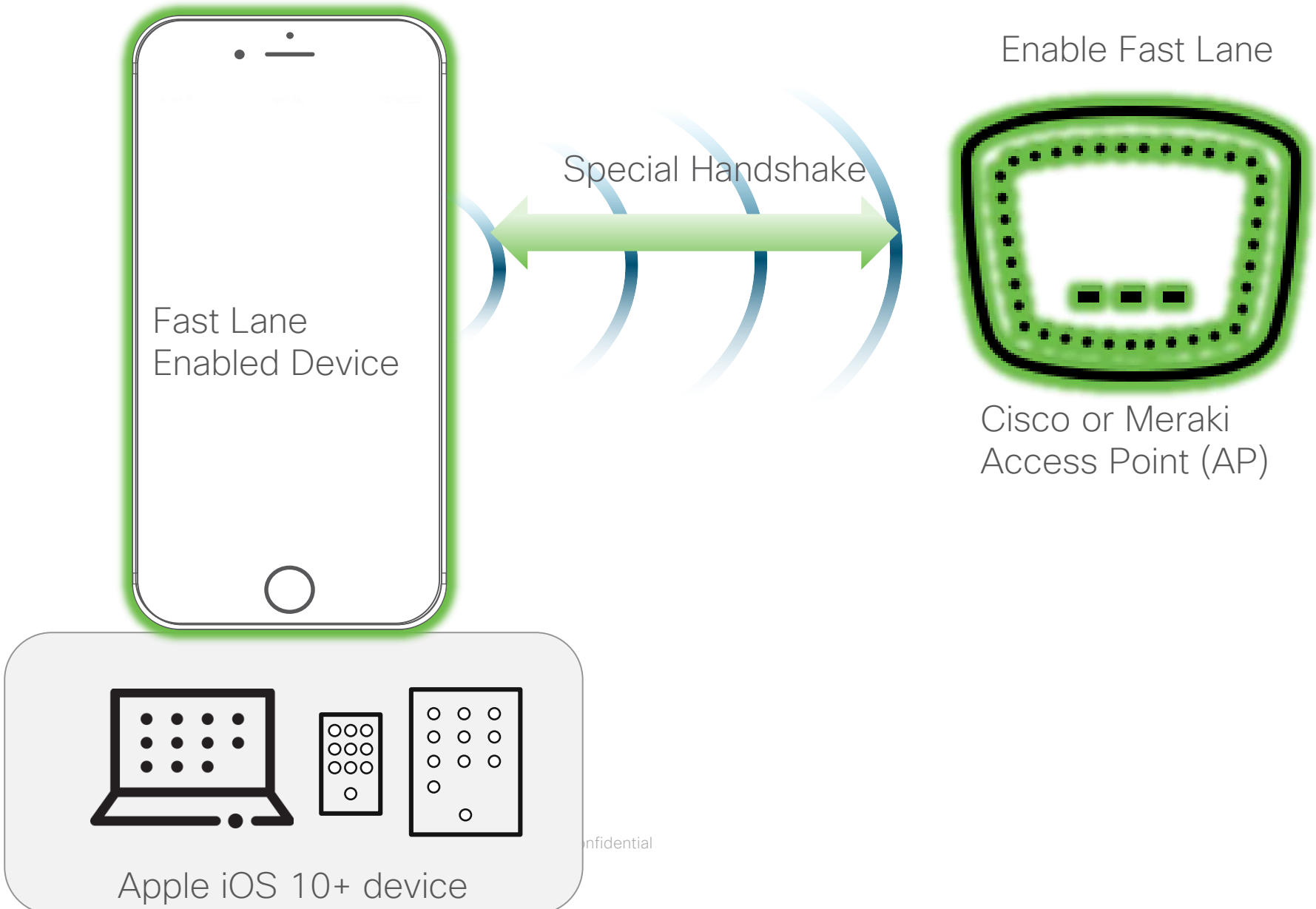
- Best-Effort
- Integrated Services (IntServ)
- Differentiated Services (DiffServ)

QoS Refresher - Types

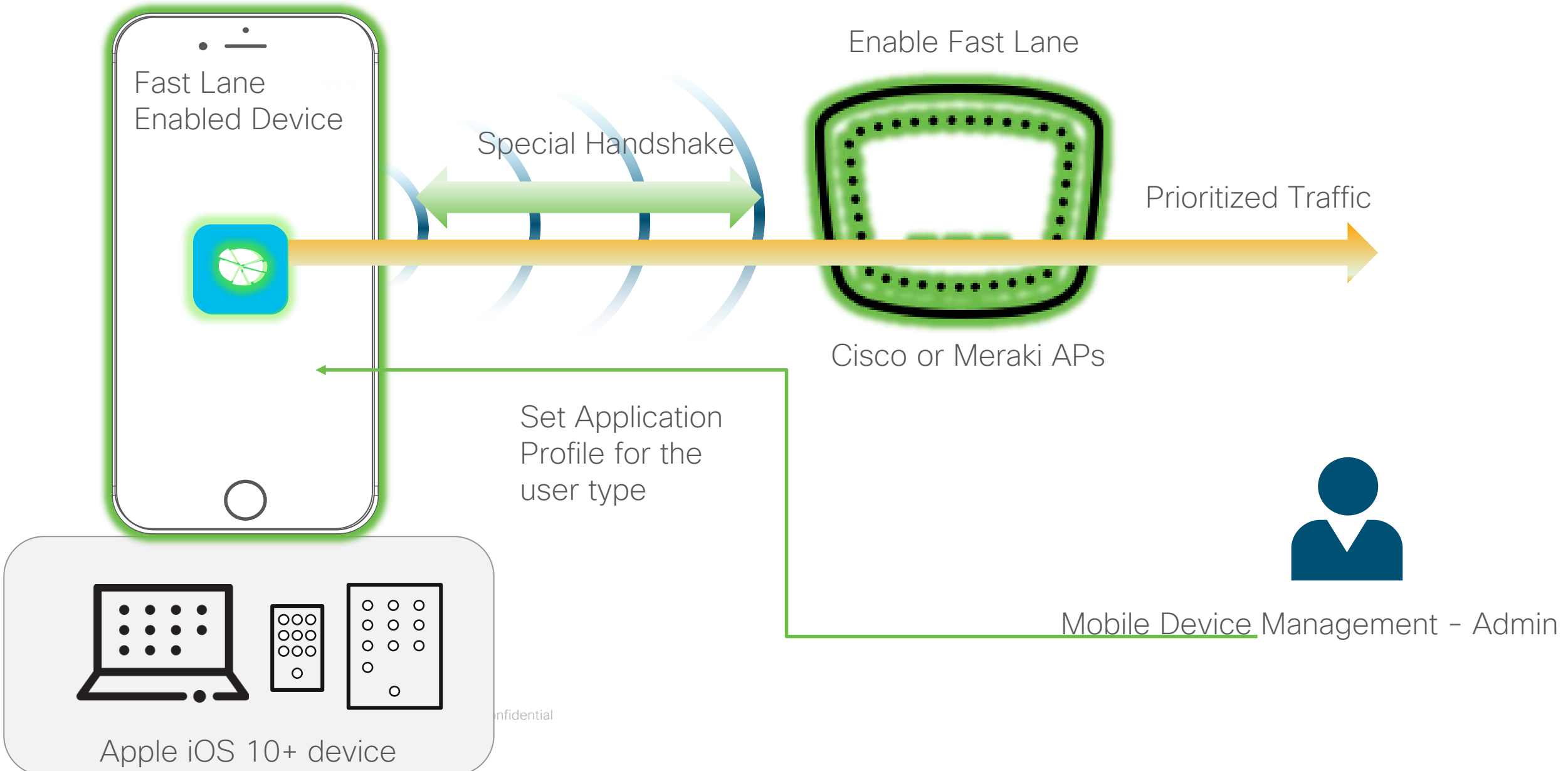
- **Best-Effort QoS** is essentially *no* QoS. Traffic is routed on a first-come, first-served basis. Sensitive traffic is treated no differently than normal traffic.
- **Integrated Services (IntServ) QoS** is also known as *end-to-end* or *hard* QoS. IntServ QoS requires an application to *signal* that it requires a specific level of service. *Every* device end-to-end must support the IntServ QoS protocol(s).
- **Differentiated Services (DiffServ) QoS** - Traffic types are organized into specific **classes,** and then **marked** to identify their classification. **Policies** are then created on a *per-hop basis* to provide a specific level of service, depending on the traffic's classification.

Fast Lane Deep Dive

Fast Lane Details

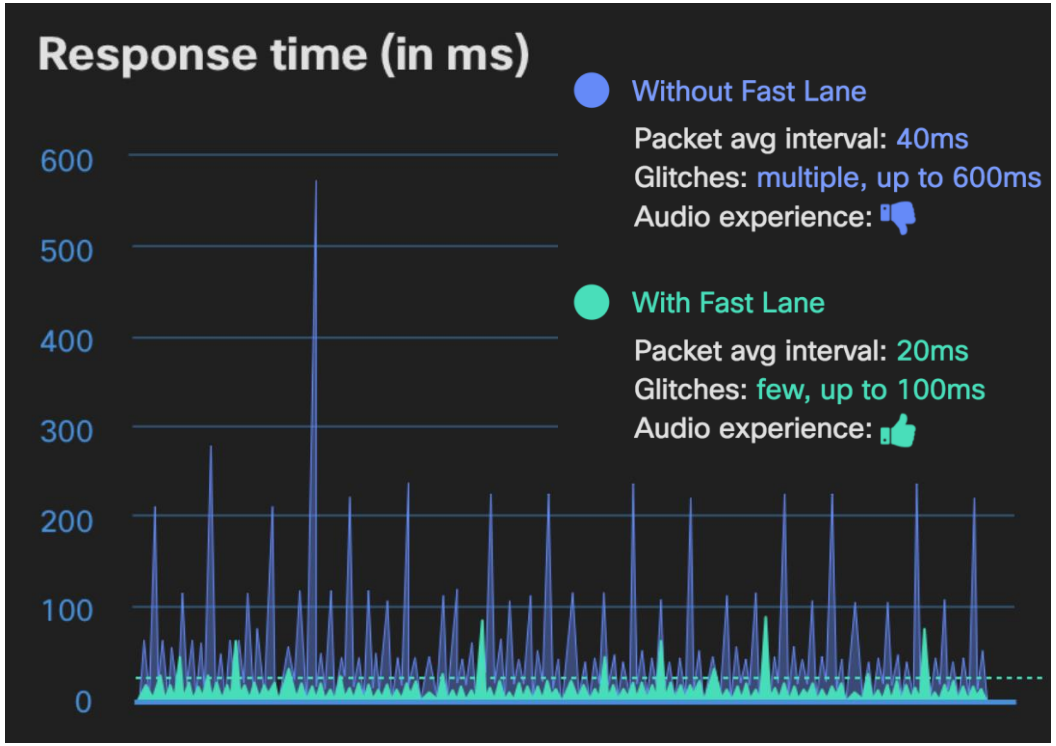


Fast Lane Details

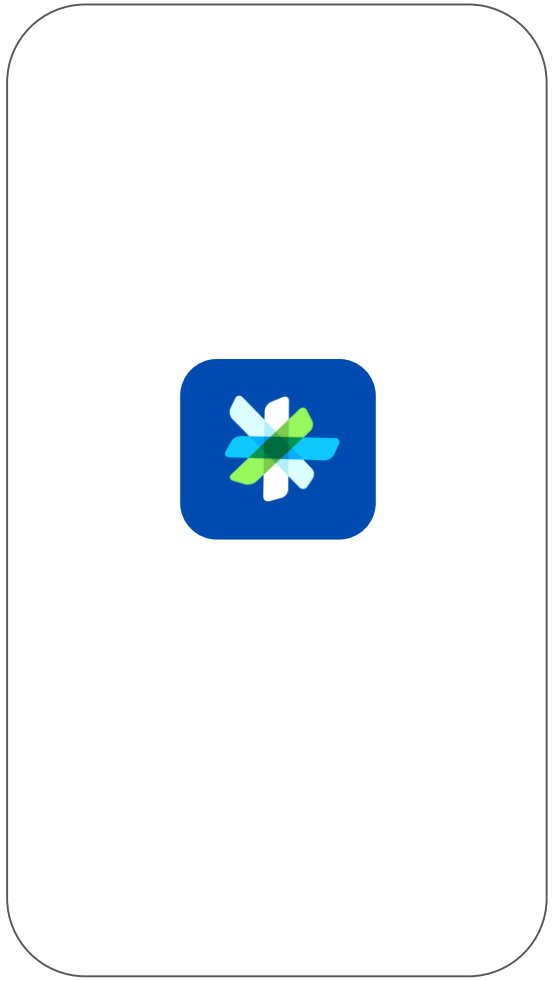


Developers work with DevNet to Fast lane enable to:

- Understand **traffic types** of their application
- Understand the required **iOS code changes**
- **Test their application** on Cisco Infrastructure – we help developers validate apps!



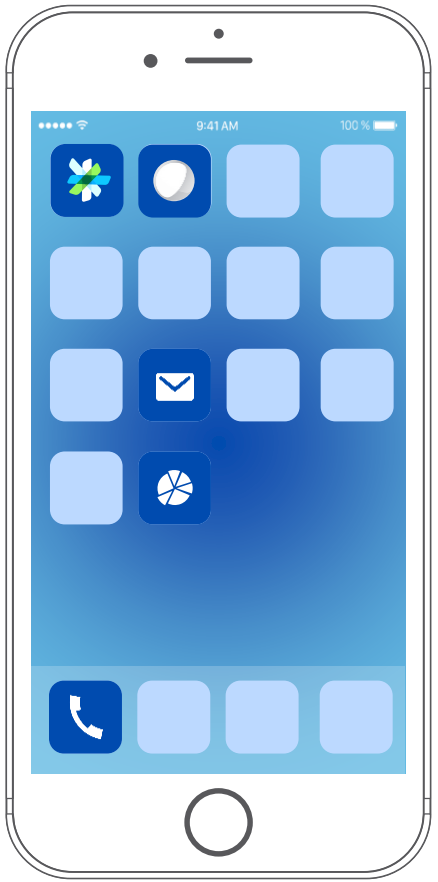
Let's Fast Lane Enable the Cisco Spark App



The Cisco Spark App does the following –

- Real-time chat
- Real-time Voice calls
- Real-time Video calls
- Signaling
- Content upload

Understanding Traffic Types



Real time Interactive Voice

Real time Interactive Video

Best Effort (Real time Data)

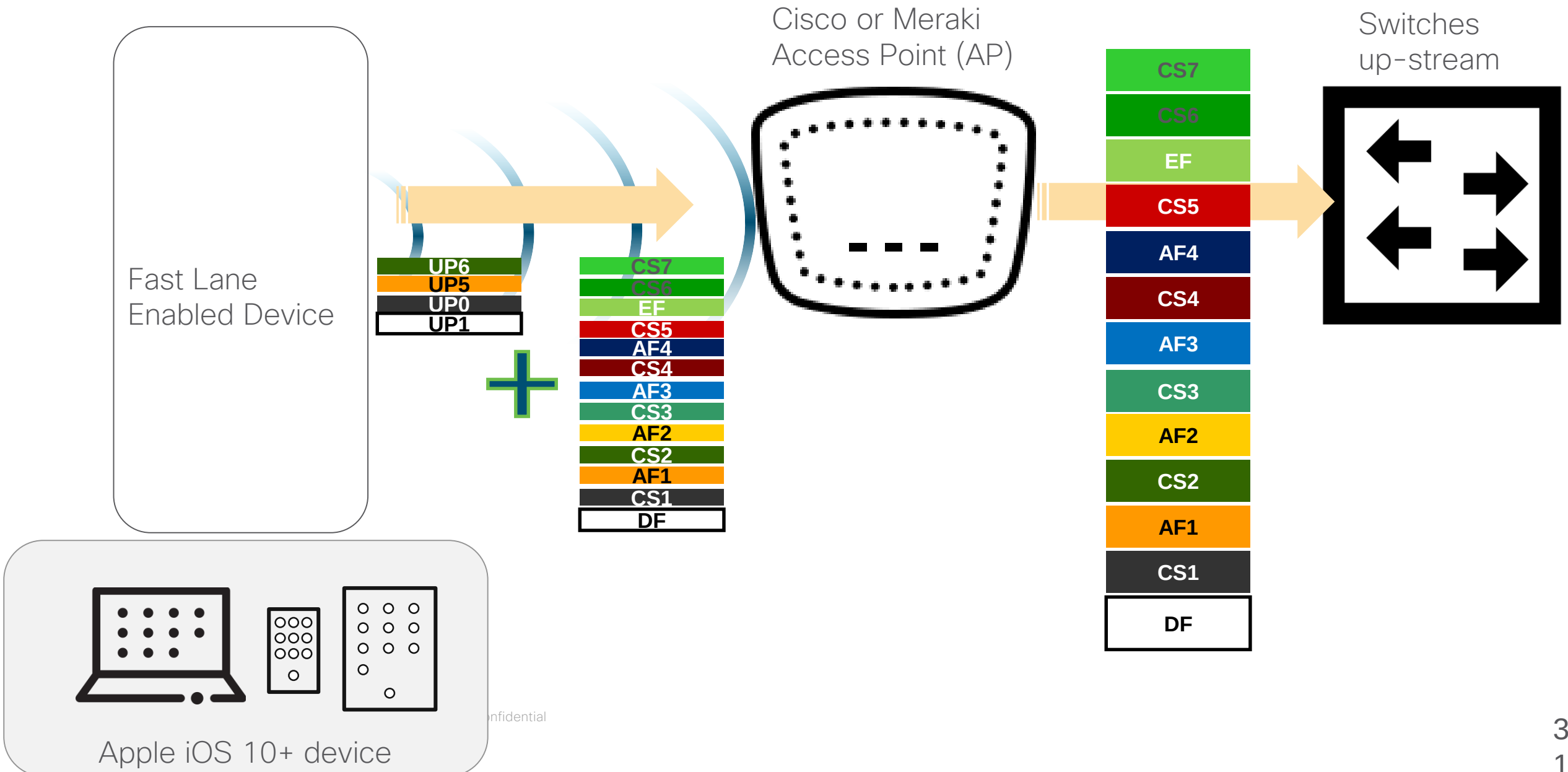
Background (backups, media uploads etc)

iOS – Service Types in different Frameworks

You set the service type property by using the following networking APIs:

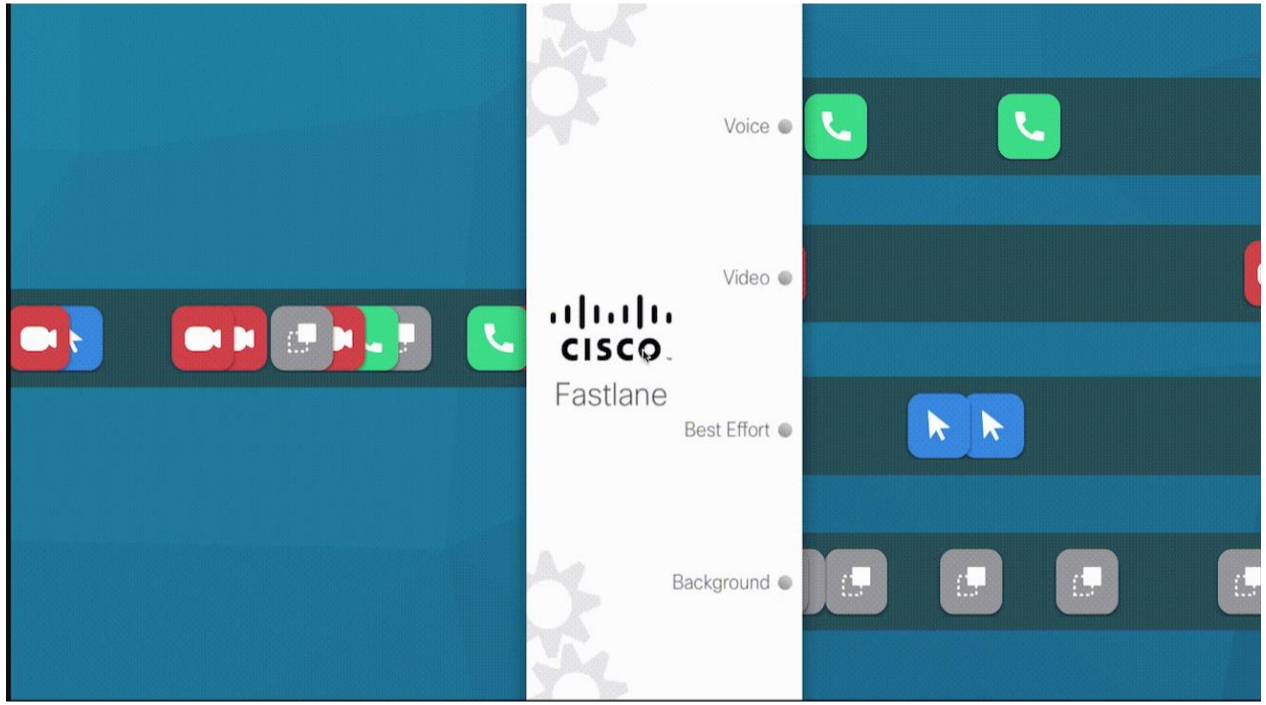
CFSocketStream	kCFStreamNetworkServiceType
NSStream	NSStreamNetworkServiceType
Stream	StreamNetworkServiceType
UDP sockets	SO_NETSERVICE_TYPE

Fast Lane Details



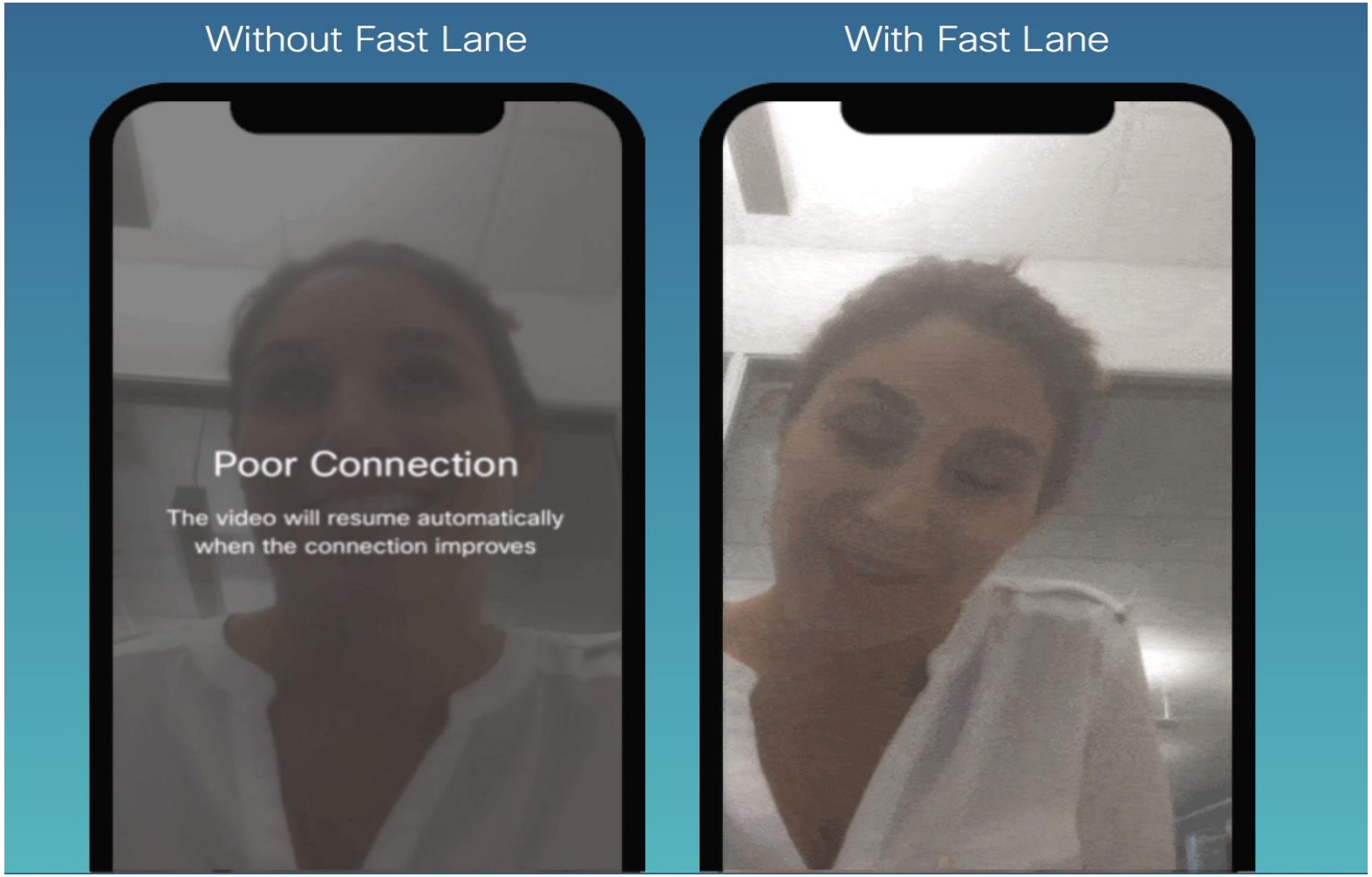
Demo

Demo



https://www.youtube.com/watch?v=kTMWNKF-xuA

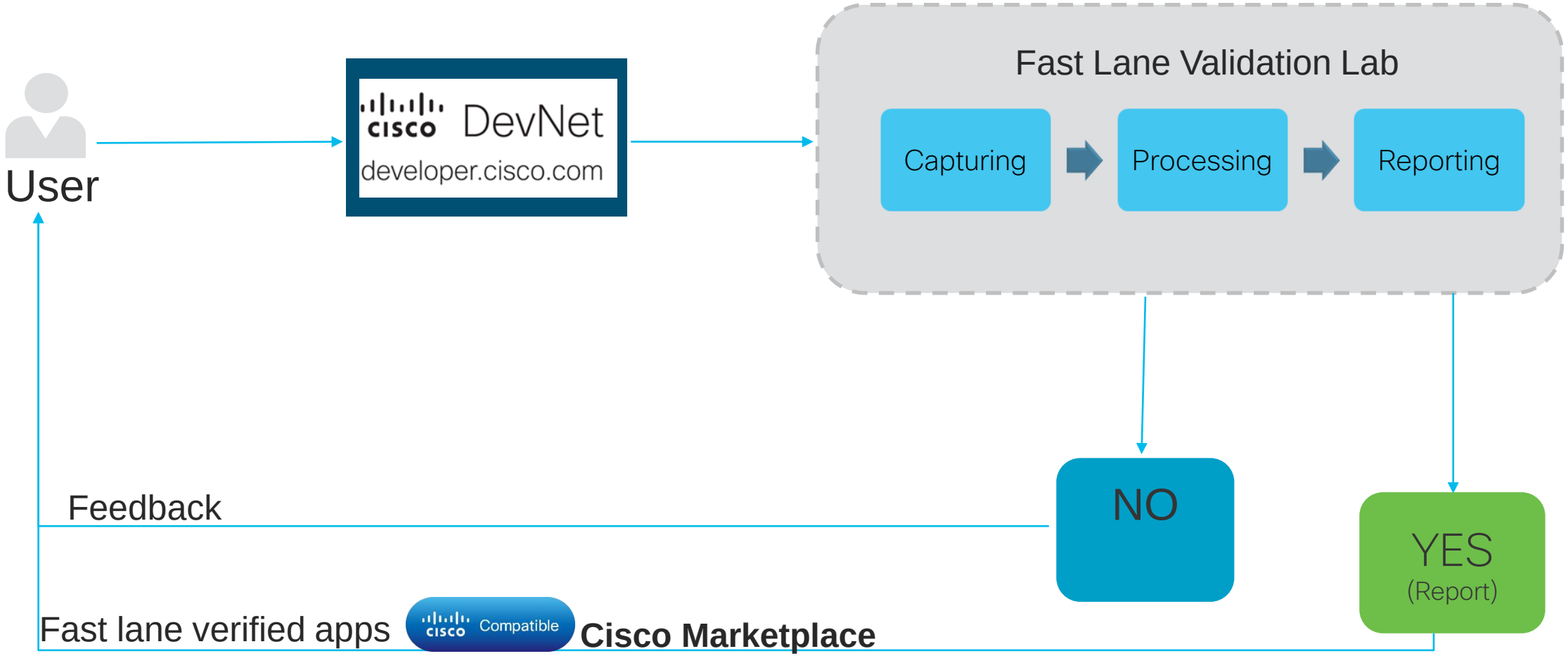
Bringing it home..



https://devnet.cisco.com/site/fast-lane/

DevNet Fast Lane Validation Labs

Fast Lane Validation Program



DevNet Fast Lane Validation Lab

The goal of this lab is to do the following:

- **Validate** if your app running on an iOS 10 device honors the Fast lane profile as well as checks with and without the application name being configured(apps in the list get QoS, apps outside the list are treated as Best Effort).
- Test for the validity of the **traffic generated by the app** to the actual tag that is marked on the traffic flow.
- Improve **user experience** (performance) of your app. Check for fewer drops and lower latency in a congested network.

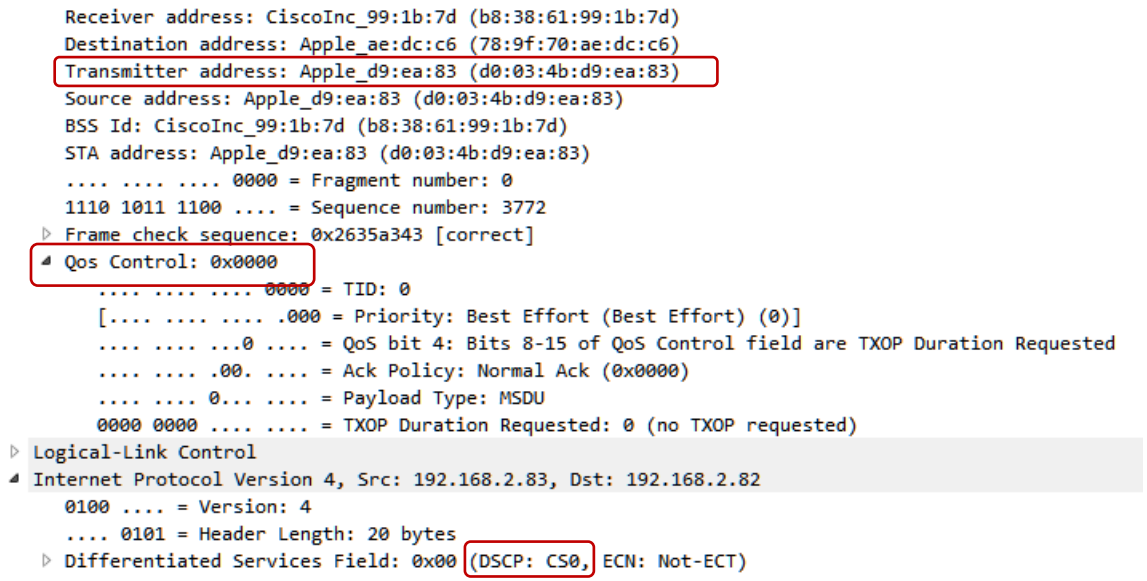
Verifying QoS – Whitelist Traffic

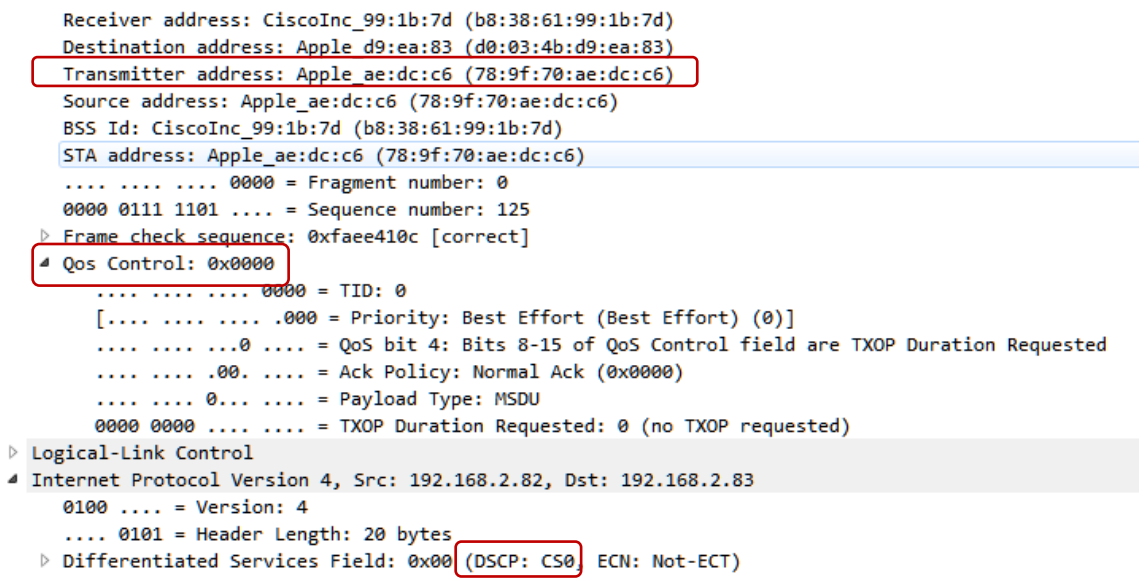
```
Receiver address: CiscoInc_99:1b:7d (b8:38:61:99:1b:7d)
Destination address: Apple_d9:ea:83 (d0:03:4b:d9:ea:83)
Transmitter address: Apple_ae:dc:c6 (78:9f:70:ae:dc:c6)
Source address: Apple_ae:dc:c6 (78:9f:70:ae:dc:c6)
BSS Id: CiscoInc_99:1b:7d (b8:38:61:99:1b:7d)
STA address: Apple_ae:dc:c6 (78:9f:70:ae:dc:c6)
.... .... .... 0000 = Fragment number: 0
0100 1111 0110 .... = Sequence number: 1270
Frame check sequence: 0x0e04873a [correct]
Qos Control: 0x0006
    .... .... .... 0110 = TID: 6
    [.... .... .... .110 = Priority: Voice (Voice) (6)]
    .... .... ...0 .... = QoS bit 4: Bits 8-15 of QoS Control field are TXOP Duration Requested
    .... .... .00. .... = Ack Policy: Normal Ack (0x0000)
    .... .... 0... .... = Payload Type: MSDU
    0000 0000 .... .... = TXOP Duration Requested: 0 (no TXOP requested)
Logical-Link Control
Internet Protocol Version 4, Src: 192.168.2.82, Dst: 192.168.2.83
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes
Differentiated Services Field: 0xb8 (DSCP: EF PHB, ECN: Not-ECT)
```

```
Receiver address: CiscoInc_99:1b:7d (b8:38:61:99:1b:7d)
Destination address: Apple_d9:ea:83 (d0:03:4b:d9:ea:83)
Transmitter address: Apple_ae:dc:c6 (78:9f:70:ae:dc:c6)
Source address: Apple_ae:dc:c6 (78:9f:70:ae:dc:c6)
BSS Id: CiscoInc_99:1b:7d (b8:38:61:99:1b:7d)
STA address: Apple_ae:dc:c6 (78:9f:70:ae:dc:c6)
.... .... .... 0000 = Fragment number: 0
1000 1100 0101 .... = Sequence number: 2245
Frame check sequence: 0xf7e43900 [correct]
Qos Control: 0x0005
    .... .... .... 0101 = TID: 5
    [.... .... .... .101 = Priority: Video (Video) (5)]
    .... .... ...0 .... = QoS bit 4: Bits 8-15 of QoS Control field are TXOP Duration Requested
    .... .... .00. .... = Ack Policy: Normal Ack (0x0000)
    .... .... 0... .... = Payload Type: MSDU
    0000 0000 .... .... = TXOP Duration Requested: 0 (no TXOP requested)
Logical-Link Control
Internet Protocol Version 4, Src: 192.168.2.82, Dst: 192.168.2.83
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes
Differentiated Services Field: 0x88 (DSCP: AF41, ECN: Not-ECT)
```

Stations do mark upstream traffic, at Layer 2 and Layer 3.

Verifying Traffic – non Fast Lane Traffic





Stations do not mark upstream traffic, at Layer 2 or Layer 3.

Summary

Careers where Fast Lane technology is relevant

Marks Application Traffic based on iOS 10 API

App Developer

Upgrades network devices.

Enables Fast Lane of required SSIDs

Network Admin

Creates and manages Enterprise App Profiles

Keeps Devices up-to-date

Mobile Device Mgr.

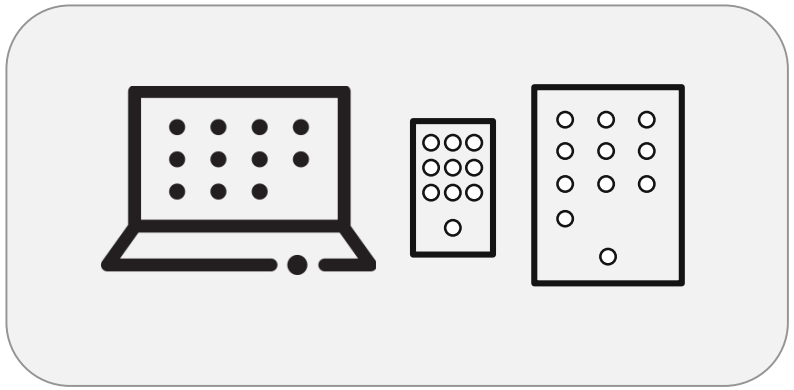
Understands App functionality

Understands QoS

Informed End User

Summary

- Fast lane enables business applications running on Apple iOS devices to prioritize their traffic [Quality of Service (QoS)] when used on Cisco Wi-Fi networks
- Simple setup on Cisco networks, turned on by default in Meraki.
- DevNet has validation Labs where any App developer or company can validate their app for free.
- DevNet has experts who are willing to consult you to enable your iOS app



Next Steps

- Join DevNet Now !

https://developer.cisco.com

- Learn more about Fast Lane at

https://devnet.cisco.com/site/fast-lane/

- Coming Soon! NetAcad Emerging Technology Workshop Using Spark REST APIs

https://netacad.com

Questions?


CISCO