partnership cloud

Exploring the Deep Linking Frontier

Boldly Go Where No Mobile Partnership Has Gone Before

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What is deep linking?

If you're a partnership professional, chances are you've heard the buzz term "deep linking," particularly in the web world. The first time, you may have scratched your head, or even Googled it in the privacy of your cubicle. And like many of us, you got an intuitive sense of what it was, why it was better than just dropping your users off on your homepage to fend for themselves, and how it helped your website conversion rates.

Back in the early days of the internet, when web-based deep linking was rare, folks viewed websites as hierarchical structures. Think of it this way: in the physical world, users have to walk through the main entrance of a drugstore and eventually make their way to the shelves they want. If they could be "deep linked," they could have instead magically transported themselves straight to the cough medicine aisle Star Trek-style.

Deep linking: A virtual transporter?

Beam us up, Scotty!

Fortunately, our thinking eventually evolved toward more direct routes. Like Star Trek, web deep linking let us beam our users directly in front of the virtual cough medicine aisle. Deep linking in the website world has been ubiquitous for years now.

In fact, you would be marketing pariah if you still systematically dropped users off on your main homepage instead of the product page of the item you were just advertising. The website world has become, well, more actual weblike, with product pages deep in your website interwoven into the fabric of your ads, emails and other websites.

Why does mobile take us back in time?

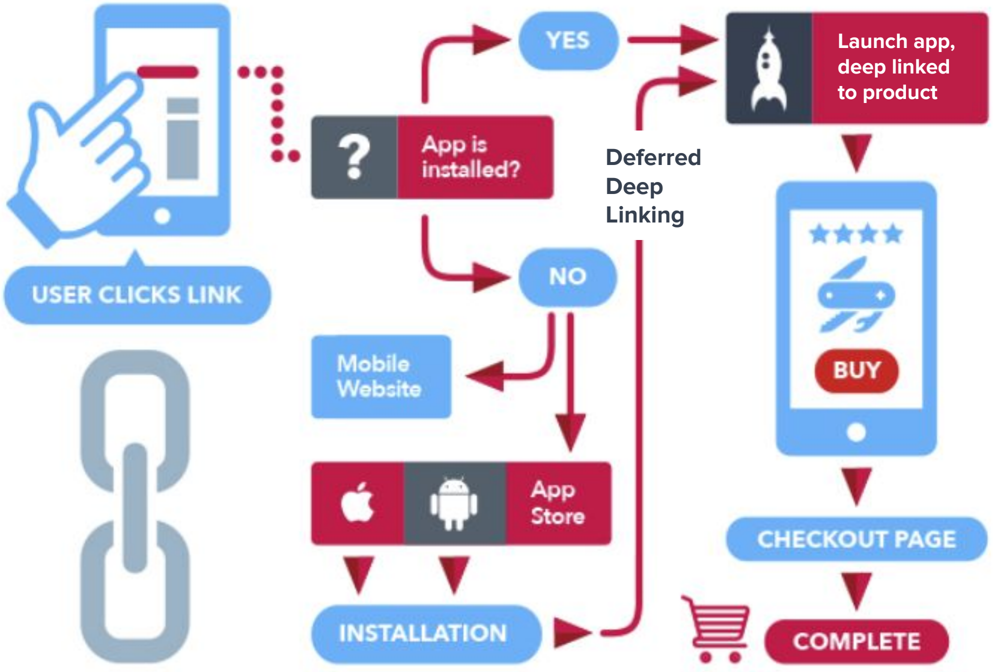
Unfortunately, when it comes to mobile app deep linking, it's not been a smooth journey. Like Kirk, Spock, and McCoy in Star Trek's "All Our Yesterdays" episode, web and apps seem to be stuck in two timeframes, with app deep linking staying stuck in the past.

Mobile app deep links, in theory, share the same principles as web deep linking – so why isn't the app world as interconnected as the web world? In fact, even if you have the app installed, why does clicking on a link still sometimes land us on the mobile website?

The deep linking experience

Mobile app deep linking may initially appear confusing, but it's actually relatively straightforward. On its facade, app deep links such as Impact's TrueLink™ provide a single link to a referring partner that can link out to the optimal location (to the right product or offer page) and environment (to the mobile web, mobile app or app store) for a given user. See how it works in the schematic diagram below.

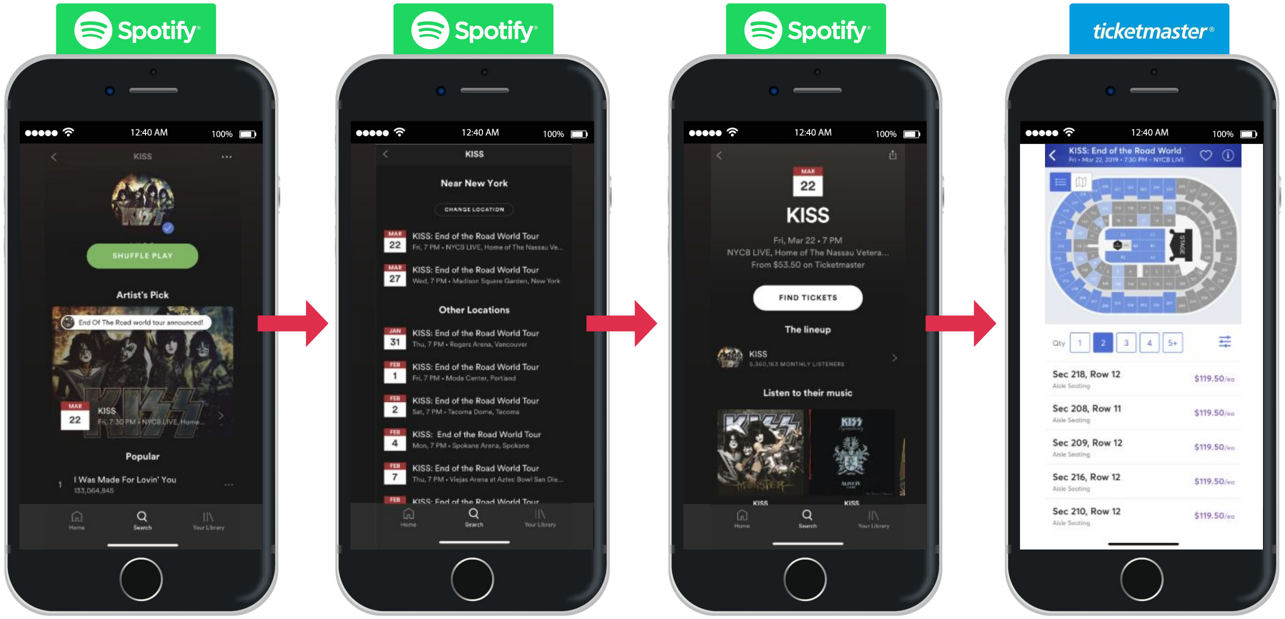
WHAT IS MOBILE DEEP LINKING?



The deep linking experience

A well-orchestrated musical experience

The following example of deep linking between the Spotify and Ticketmaster apps gives you an idea of the improved experience that deep linking brings to the user:



End Of The Road world tour announced!

MAR 22 KISS
Fri, 7:30 PM • NYCB LIVE, Home...

1 I Was Made For Lovin' You
133,064,845

Near New York

MAR 22 KISS: End of the Road World Tour
Fri, 7 PM • NYCB LIVE, Home of The Nassau Ve...

MAR 27 KISS: End of the Road World Tour
Wed, 7 PM • Madison Square Garden, New York

Other Locations

JAN 31 KISS: End of the Road World Tour
Thu, 7 PM • Rogers Arena, Vancouver

FEB 1 KISS: End of the Road World Tour
Fri, 7 PM • Moda Center, Portland

FEB 2 KISS: End of the Road World Tour
Sat, 7 PM • Tacoma Dome, Tacoma

FEB 4 KISS: End of the Road World Tour
Mon, 7 PM • Spokane Arena, Spokane

FEB 7 KISS: End of the Road World Tour
Thu, 7 PM • Viejas Arena at Aztec Bowl San Die...

FEB KISS: End of the Road World Tour

MAR 22
KISS
Fri, Mar 22 • 7 PM
NYCB LIVE, Home of The Nassau Vetera...
From $53.50 on Ticketmaster

The lineup

KISS
5,360,163 MONTHLY LISTENERS

Listen to their music

KISS
KISS

KISS: End of the Road World
Fri • Mar 22, 2019 • 7:30 PM • NYCB LIVE

Sec 218, Row 12 Aisle Seating	$119.50/ea
Sec 208, Row 11 Aisle Seating	$119.50/ea
Sec 209, Row 12 Aisle Seating	$119.50/ea
Sec 216, Row 12 Aisle Seating	$119.50/ea
Sec 210, Row 12 Aisle Seating	$119.50/ea

Users who are listening to a particular band get shown a C2A for that band's shows in their geographical vicinity via data coming from Ticketmaster. The user can select a date and when they click through, they are deep linked into the seat map "page" within Ticketmaster's app to make a purchase. It is a seamless user journey optimized for conversion.

Blame the past for the present confusion

Much of mobile deep linking's perceived complexity is a relic of confusing legacy architectural decisions from mobile platforms of the past.

Fortunately, platforms have gotten their act together, and the mobile world is in a far better place today. Mobile deep linking is poised for widespread adoption. And no wonder – who would say "no" to major mobile deep linking benefits such as increased user engagement and conversion rates?

Deep linking is known to drive more engaged traffic into your app, which drives better business results compared to the mobile web. Consider the following statistics:

Compared to mobile web, in-app conversion rates are

3x

higher

Compared to mobile web, in-app average order value (AOV) is

140%

higher

Sources: Criteo Global Commerce Review, Branch's The Agile Approach to Building an Effective Mobile Growth Stack

Point A to Point B: It just works

Recapping how linking works in the web world

Does "uniform resource locator" roll off your tongue? Do you understand how hypertext transfer protocols work? It's ok if you don't. However, living on this planet for a while, you do intuitively understand how a "URL" works, and know that "https://" before that URL helps the browser point you in the right direction.

When you click a URL, you expect to be taken to a website. The more specific the URL, the more specific the page you expect. For example, if you click toys.com, you anticipate being directed to the toys.com homepage. If you click toys.com/cars/SKU1234, you expect to be taken to a specific product page within the toys.com site. And if you click toys.com/cars/SKU1234?ref=offerXYZ, you might expect that product page to open with a preloaded coupon.

Of course, when you're in the midst of browsing and jumping from one site to the other, you're not focused on the actual URL string taking you from virtual Point A to virtual Point B. Rather, you understand the context in which you're invited to click—and develop expectations accordingly.

Naturally, you might be disappointed if you clicked an offer for 50% off, only to be routed to the homepage and have to find both the toy and the offer yourself. If you're a patient person, you may diligently suffer through this ordeal – but most people will just bounce.

Point A to Point B on mobile

It should just work in mobile too, right?

Likewise, as the world of mobile apps have become a part of our everyday lives, we've come to expect the same experience in mobile environments, despite the added complexity of moving between web browsers and applications. For example:

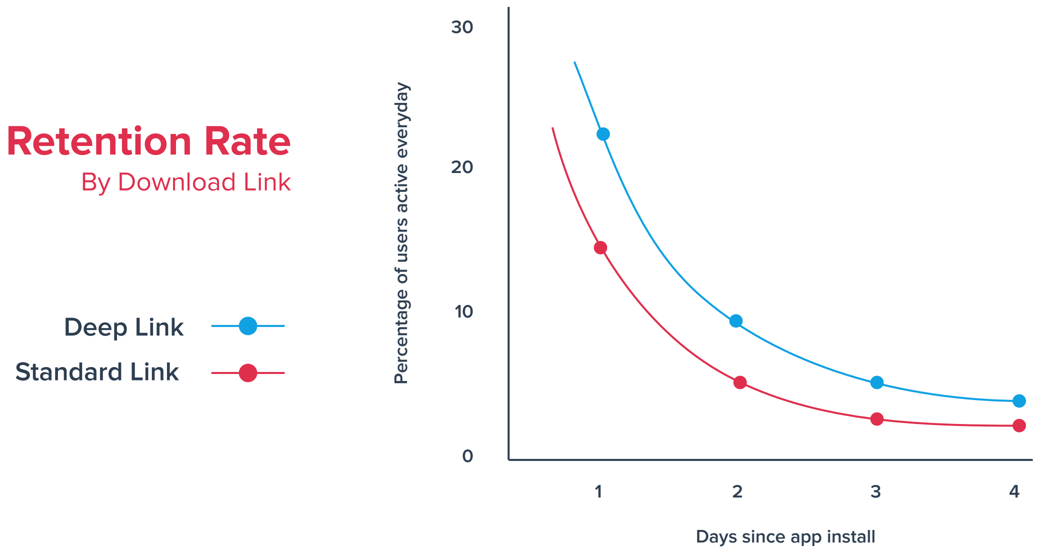
- When we tap a link and already have the corresponding app installed, we want to be routed to the right place within that app.
- If we don't have that particular app, we expect to be taken either to a mobile web page or to the app store where we can download the app.
- Or, even better, we might even be provided a choice: take us to the right page on the mobile web or to the mobile app in the app store so I can install it and continue on with my experience.
- Once we've installed and opened the app, we expect it to open not only where we thought it would, but also loaded with any credits, offers, or rebates we may have been promised along the way. Bonus points for personalization.

This is the essence of mobile deep linking. As users, we usually experience this seamlessly. But as mobile partnership managers, we also recognize that there's a lot going on behind the screens to make everything work properly.

Engaged customers are high LTV customers

Users with a good mobile experience bounce around a lot less and convert a lot more when they are taken from a tailored ad or partner link into a relevant in-app experience — with no hiccups along the way.

Take a look at this fascinating study by Branch.io. They found that users who were dropped off on the app homepage were significantly less engaged than users who were deep linked in the app. Users who were deep linked had a far greater likelihood of turning into a daily active user of the app, most likely because they enjoyed a better, more relevant user experience. And more daily active users often translates to higher lifetime value (LTV) users and a greater revenue potential for your business.



So how *do* those virtual transporters really work?

So now you know how to answer "What is mobile deep linking?" and "Why does deep linking matter for my business?"

Mobile deep linking is nothing more than enabling the smooth navigation between websites, webpages, apps, and app "pages." It's smart linking behavior, much like how Star Trek's transporters don't (usually) beam the crew into the middle of a wall or mountain. With deep linking, you are likely to drive more engaged traffic into your app and achieve greater revenue for your partnership program.

But how does mobile deep linking work? Is it really harder to do deep linking on mobile? Let's take a moment to peek under the hood of these virtual transporters.

How deep linking works

Web v. app environments: Digging in to differences in deep linking

The deep linking concept exists in both web and app environments, though their nomenclature and physics (or functionality, as we're talking about the technical and not the sci-fi world…) differ.

In order to navigate smoothly between web pages, a browser needs an address. The URL is that address, and appears as either http://*** or https://***.

In an app environment, in order to navigate smoothly between apps and different states within the app ("pages"), the device and destination app need an address too, particularly when "linking" into the app from the outside. Deep links provide the address that allows external applications to refer to a specific location within the app.

While mobile deep links are in many ways analogous to web-based links, it's also important to recognize their differences.

Differences between deep links on the web and in-app

First, phones introduce an additional layer of complexity because:

- Mobile users navigate not just within a browser but between web browsers and mobile applications
- Mobile devices must identify which app (if it is installed) is the relevant one to open
- There must be a way to contain conditional information (i.e., what to do if the app is not installed)
- There needs to be a way to retain information between:
    - the initial link click
    - the visit to the app store
    - the installation of the app
    - the subsequent launch of the app (even if the user doesn't open it immediately)

Second, there's no real concept of pages in an app. Though it may appear this way to the user, app "pages" are really just "states" of that application. So, much like how Star Trek transporters reassemble matter in the desired location, the app must assemble the app "page" on the basis of variable inputs about the user's session.

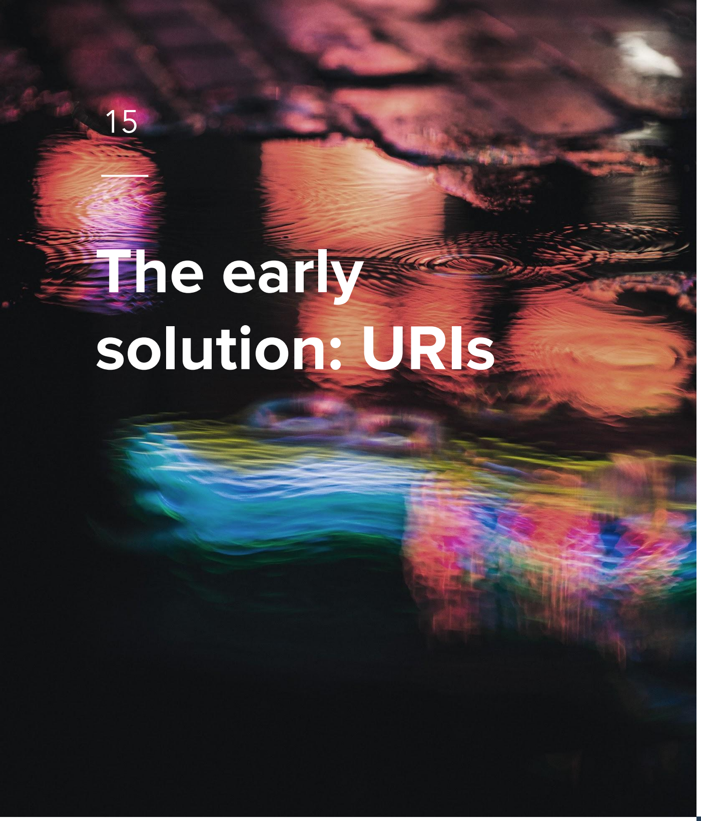
Deep linking “standards”

It is largely due to the differences between web and in-app, as well as the bifurcated systems between iOS and Android, that mobile deep linking has grown so much more complex.

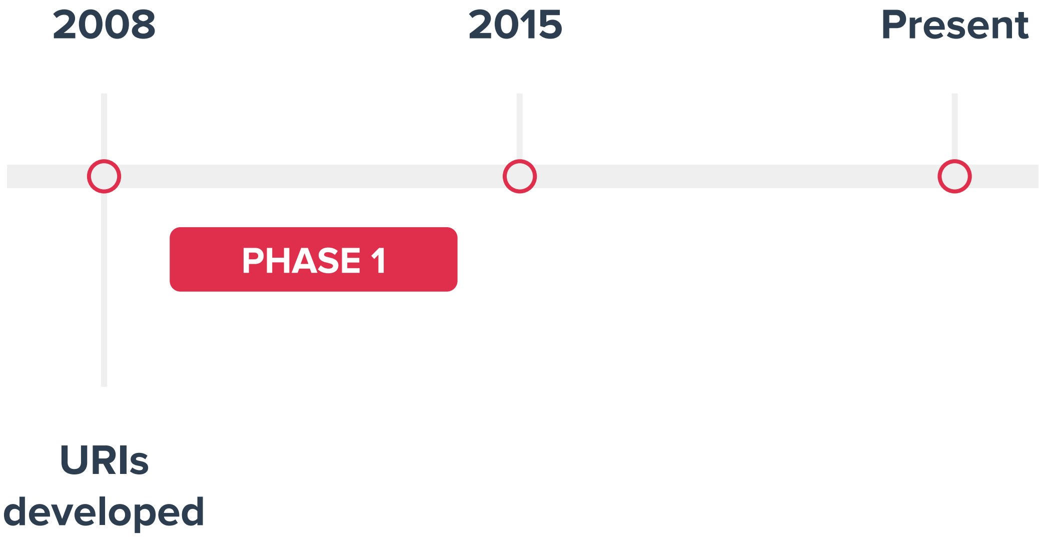
In the following sections, we will review several of the most popular deep linking "standards."

Note that we've put the term "standards" in quotes here. That's because a true industry standard is something that's planned, coordinated and agreed upon by different companies in an industry, and these companies are often competitors. They determine that the industry would be better off with a single approach in order for to encourage scalable adoption.

This did not happen in the mobile app world. Standards are supposed to be platform-agnostic, and the major platforms have defined their own individualized "standards."



The early solution: URIs



2008

2015

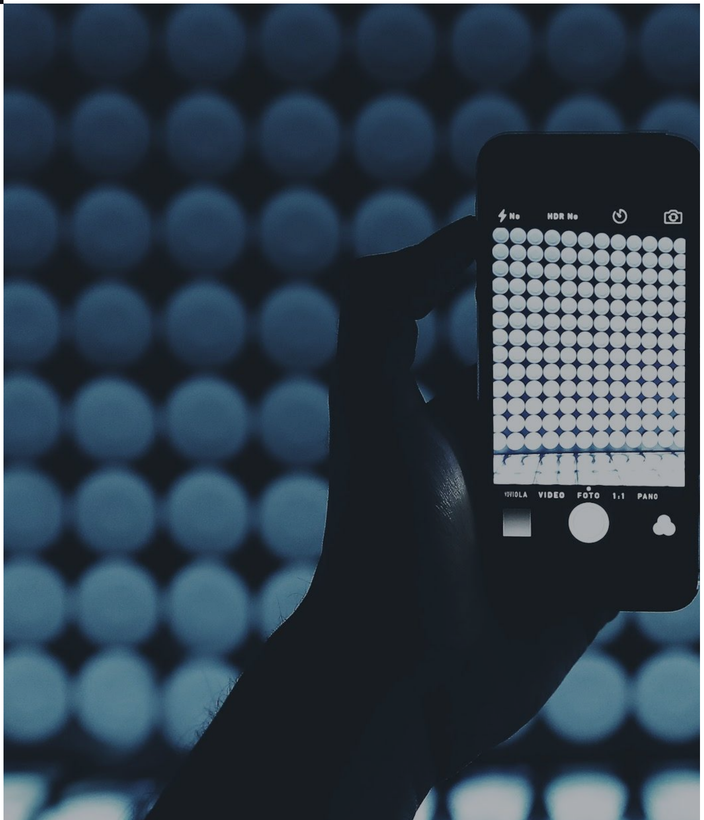
Present

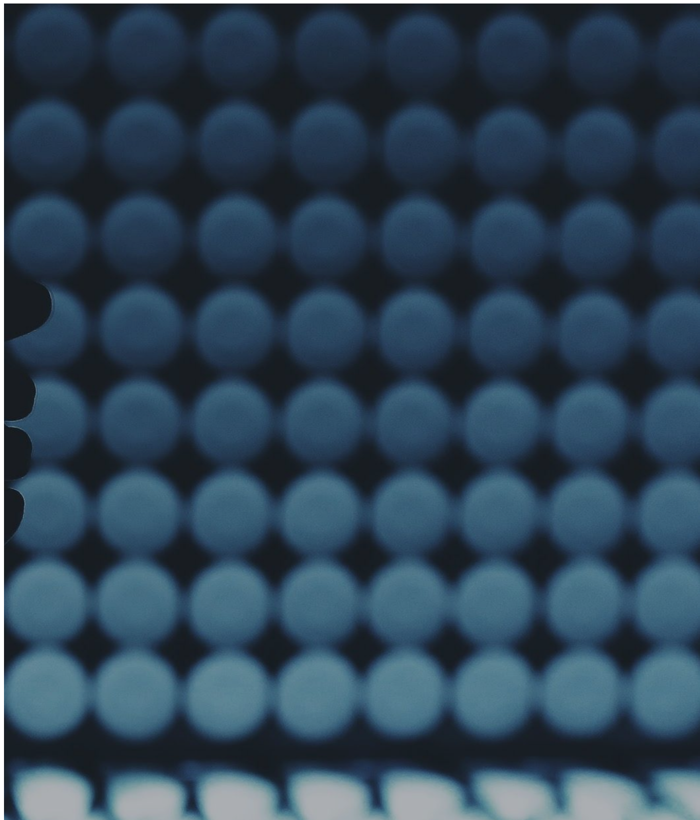
PHASE 1

URIs developed

The first iteration of mobile deep links is something called a universal resource indicator, or URI, and was introduced around 2008.

This actually was a standard (not in quotes!) at the time because both iOS and Android adopted it.





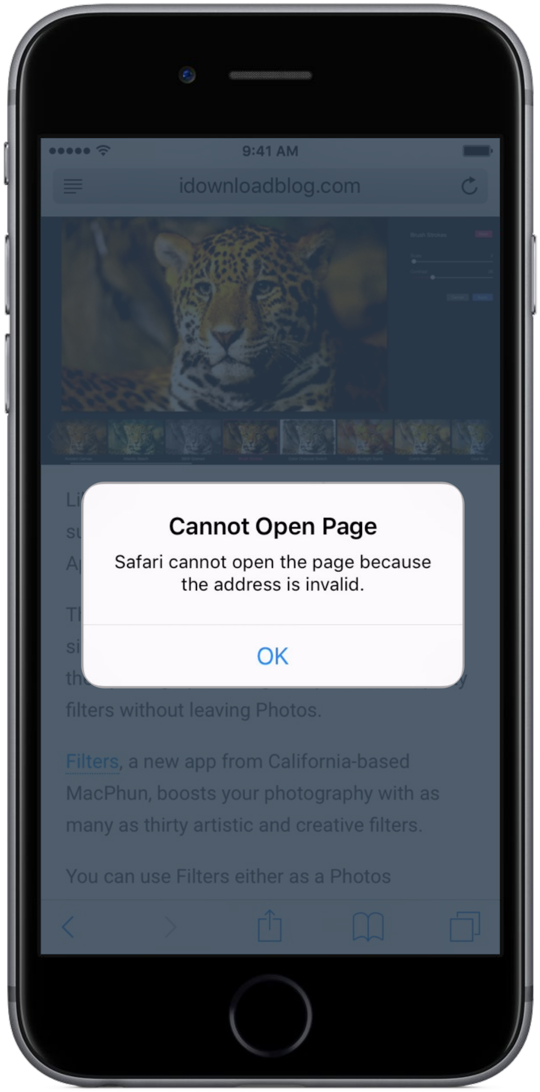
URIs: Not a very well-thought-through standard

URIs are analogous to URLs since they simply represent the address for an app on a mobile device (e.g., fb://*** will tell the operating system to open the Facebook app). When a user clicks on a URI, the operating system triggers the app to open to the specified state.

There are two main issues with URIs, however, which is why they are mostly in use today either as backups or for old operating systems (iOS <v9, Android <v6).

Issue #1: Poor user experience

First, a URI requires the destination app to be installed on the device. If the app is not installed, then clicking on a URI will result in an error (Note: there are workarounds to this using secondary scripts, but they break with each new app update).



Cannot Open Page

Safari cannot open the page because the address is invalid.

filters without leaving Photos.

Filters, a new app from California-based MacPhun, boosts your photography with as many as thirty artistic and creative filters.

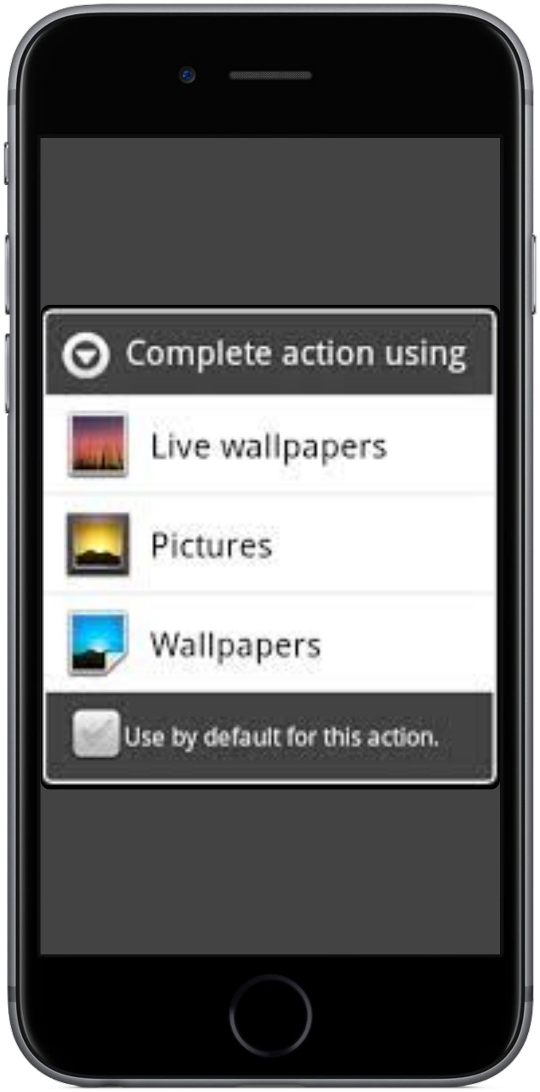
You can use Filters either as a Photos

URIs: Not a very well-thought-through standard

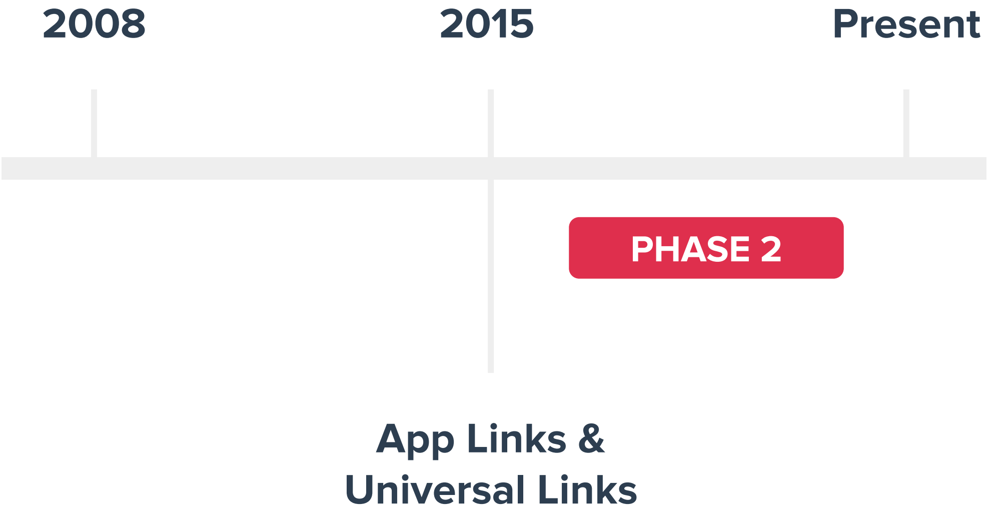
Issue #2: Hijacking

Second, there is no central registration for URIs, which introduces a contention issue if multiple apps intentionally or accidentally claim the same URI scheme. Without any kind of arbitration mechanism, the operating system simply gives the user a choice among apps, in the form of a disambiguation box such as the one here.

Imagine if you woke up tomorrow to discover that an upstart competitor is claiming your brand's URI, and now all users who click links with that scheme are given a choice between your app and theirs! To say the least, by relying on URIs, you introduce the possibility that users may continue on a different path than the one you intended.



The “Next Generation”: App Links and Universal Links



Just as Star Trek 1.0 inspired Star Trek: The Next Generation, mobile’s “standards” evolved. To help resolve the issues presented by URIs, around 2015, the main operating systems introduced new deep linking “standards“ (the quotes return!):

- Universal Links on iOS 9+
- App Links on Android 6+

Though they functionally achieve the same thing, their underlying architecture, components and mechanisms (which we won’t go into here) differ, to the confusion of mobile marketers and technologists everywhere.

Universal Links and App Links

Enter mobile deep links that look just like regular web URLs

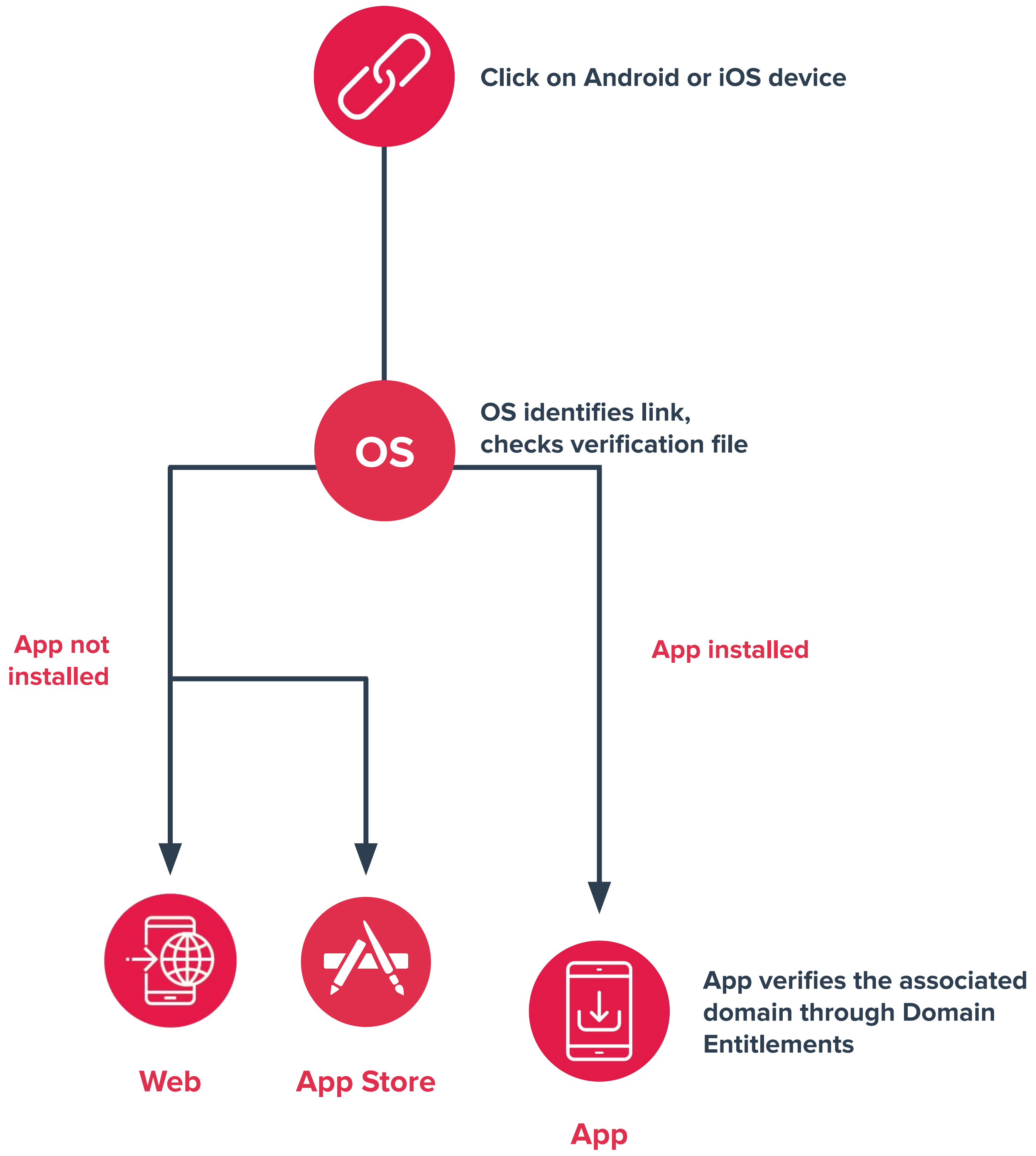
Universal Links and App Links are simply URLs that point to both a web page and a location inside an app. When tapped from within a mobile device, the operating system will check whether the app is installed. If it is, with a little help from the app code, it will open to the corresponding location in the app. If it is not, it will open the equivalent URL in the phone's browser.

Since Universal Links and App Links are centralized by Apple and Google respectively, this approach also resolves the problem of multiple apps claiming the same address. Because web domains can only have one owner, it works by requiring app owners to upload a verification file to their web domain. That file associates various URLs to different apps. When a user clicks one of these links, the operating system can ping the verification file first (which is usually cached on your phone when you install or update the app), search for the app, and route the user to the appropriate location if installed.

It also works the other way around. The app also acknowledges its associated domain through a mechanism called domain entitlements. This provides a two-way handshake and makes the architecture extremely secure since both app and domain confirm each other.

To help you visualize how this works, see the diagram on the next page.

Universal Links and App Links



Click on Android or iOS device

OS identifies link, checks verification file

App not installed

App installed

App verifies the associated domain through Domain Entitlements

Challenges

The trouble with tribbles is...

While App Links and Universal Links incrementally improve the user experience, they have drawbacks as well:

- First, they offer no solution for what's known as deferred deep linking — when a user without an app installed gets redirected to the app store, and then the app remembers what state to open once the app is launched.
- Second, since they don't pass through any gateway or redirection chain, it makes click tracking impossible (Note: Android still does allow custom URI schemes as fallbacks, so the issue is less critical on Android devices).

To tackle each challenge, mobile partnership specialists may either build supplemental technology or partner with a third party.

Deferred deep linking

Wait, there's more to deep linking?

Yes – as we mentioned, the mobile world contains this wonderful innovation known as deferred deep linking. A user who does not have the retailer's app installed may see a great offer on a partner's mobile website. When they click on it, the retailer may want to encourage the user to install the app (i.e., "Hey, take an additional 5% off your purchase if you install the app!"). When the user installs and opens the app, they are taken to the location in the app containing the offer that they had originally found so interesting in the first place. Plus, for installing the app for the first time, they get an additional 5% off on top of the original offer to boot!

To execute deferred deep linking on Universal Links and App Links, a solution must employ a version of device fingerprinting.

What is device fingerprinting (which is sometimes called device snapshotting)? It sounds a little bit insidious, doesn't it? Sort of like the Borg from Star Trek: The Next Generation assimilating you into the Collective...

Well, whether it's called device fingerprinting or device snapshotting, its use in deferred deep linking is actually mostly innocuous—not Borg-like at all!

Deferred deep linking

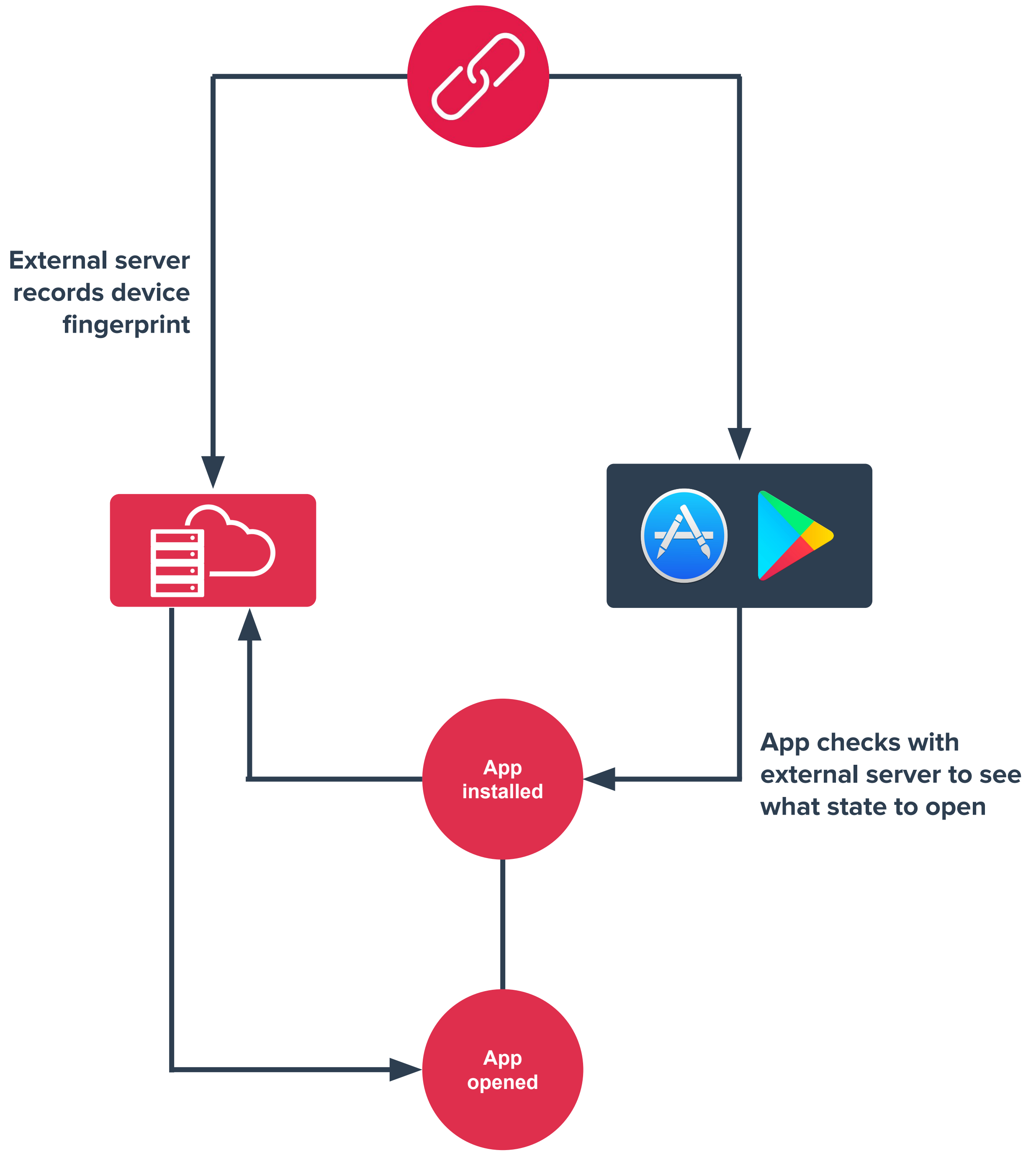
How does device fingerprinting work? How is it used?

Any time a deep link is clicked, that link sends a trove of data to be saved on an external server, including the clicked address and timestamp, the IP address, and the device's type, model, screen size, and operating system, and many more attributes – all of which make up the device fingerprint.

Upon app open, the app will ping the server to see whether any profiles match the same attributes (i.e., have we recently seen this same device fingerprint?). If there is a match, the app will load in the appropriate state and achieve the desired user experience.

The diagram on the next page shows how deferred deep linking works.

Deferred deep linking



External server records device fingerprint

App checks with external server to see what state to open

partnership cloud

Deep linking and click tracking

Simple so far, right? Let's add another minor complication

Okay, you've plumbed the depths of the Delta Quadrant of deep linking and gotten through it, so you can handle this interesting twist: in-app click tracking.

Executing click tracking and attribution on Universal Links and App Links is a bit more clunky, but still possible with additional technology. The challenge occurs when a user clicks one of these links and has the app installed — the app will launch immediately, with no redirection. In such cases, several workarounds are available:

- Simulate a click after the app is opened, for example, by opening a webview that itself creates a redirect
- Send a request to an external server to record a click whenever the app is opened as a result of a Universal Link or App Link.

Either way, to accurately track clicks, an extra step is necessary to understand what drove (and credit the source of) a particular event within and app.

Deep linking and click tracking

TrueLink saves the day for mobile

Impact leverages a combination of TrueLink™, which simplifies the complexities of deep linking, with the magic of our page-load API, which simplifies click tracking. This combination solution handles the messiness of determining not only if the app is being opened, but also if, when the app had already been open, a new session was started (such as when the app has been in the background inactive for more than 30 minutes). It orchestrates all that complexity so your app developers don't have to.

The best part is that your mobile partners don't have to do anything extra to get this all working—they receive the same tracking URL they've always had!

Conclusion: Bringing it all back to Earth

You've explored the furthest reaches and complexities of the mobile galaxy – now it's time to come back to Earth. What does it all mean for you?

Just as the consumer doesn't need to be preoccupied with the mechanics of HTTP requests, you and your partners don't need to personally juggle the complexities of mobile deep linking. The right partnership platform can deliver a single link that does all the heavy lifting for you, which you can then pass to your media partners without concern for URIs, App Links, Universal Links, or proper click tracking. Everything from routing and tracking to fallback behavior should be handled behind the curtain and no extra work for your partners – it should just work.

This is true regardless of the situation: app-to-app, web-to-app, web-to-store-to-app, or app-to-store-to-app. All scenarios should ultimately be able to direct users to a specific place in your app and track your partner referrals seamlessly.

Either way, with the right technology and a robust mobile partnership solution, you can rest easy knowing that your users will have an optimal experience, regardless of the device they're using or if they have your app installed or not. You can simply enjoy the higher conversion rates, AOVs and greater purchase frequency of the in-app world.

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by Impact

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Radius expands your capacity for managing partners and affiliates. It heightens your efficiency every step of the way, beginning with contracting, then tracking true performance, and delivering payment.

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