



GA4 Implementation

A Guide For Marketers

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What is new about GA4?

The short answer would be... a lot. The long answer is that GA4 is Google's solution to a couple of big problems facing the future of digital marketing analytics.

One key issue that GA4 seeks to address are the privacy concerns and new legislation around the use of cookies (we'll talk more about that later). The second is how brands can correctly attribute visitors across different devices and between websites and apps.

GA4 moves to solve these issues by using a fundamentally different way of tracking users, based on an **events model**. Instead of tying together **hits** within a **session** based on data stored in a cookie (as with GA3), GA4 instead records every user interaction as an **event**, with these events then being associated with users or groups of users.

The Basics – Getting Started

To get started with GA4, we have a few options open to us. However, at the outset, it is important to note that GA4 will only start collecting data from the time that it is installed and cannot pull historical data over from Universal Analytics (GA3).

With that said, the two avenues available for deploying GA4 are to use the ‘GA4 Setup Assistant’ to upgrade an existing Universal Analytics property to GA4, or to create and new GA4 property from scratch and install the tracking code.

For more information on both these options, feel free to take a look at our **GA4 Implementation Guide**.

What are Events in GA4?

In the last section we talked about Events, but what are events in GA4?

“An event allows you to measure a distinct user interaction on a website or app. For example, loading a page, clicking a link, and completing a purchase are all interactions you can measure with events.”

By default, GA4 collects more than 40 types of events, some without the need for any configuration (note that many are specific to apps only). However, the real power of GA4 is that it allows us to create custom events to track anything that we'd like. For website data, there is no limit on the number of events that can be collected, and a limit of 500 for apps.

Custom Events

Those familiar with events in Universal Analytics will remember that they were limited to collecting an *action*, *label* and *category*. This is not the case in GA4.

GA4 events can collect up to 25 different properties, describing the who, what, where, when and how the event happened. In GA4, these properties are called **parameters**.

For example, we could collect an event called **Applied for Programme**, which could have parameters including, *Department Name*, *Programme Type* and *Mode of Study*.

The data collected in custom events will need to be configured by a web developer, but the events themselves can be set up within GA4 or Google Tag Manager.

Other key differences

Before we dive into looking at specific GA4 reports and features, it is worth mentioning a few key differences between what we are used to seeing in Universal Analytics versus GA4.

Users Before we dive into looking at specific GA4 reports and features, it is worth mentioning a few key differences between what we are used to seeing in Universal Analytics versus GA4.

Users

In UA the primary user metric is 'Total Users' while GA4 uses 'Active Users' (users with an engaged session).

Engagement

In UA we are used to Bounce Rate and Average Time on Site/Page. In GA4 these have been replaced with Engagement Rate and Average Engagement Time. In GA4 an 'engaged session' is one that lasts for more than 10 seconds or has triggered more than one event (unless a conversion, then only one is needed). Engagement Time is calculated as the average time between the first engagement (event) and the last.

In UA the primary user metric is 'Total Users' while GA4 uses 'Active Users' (users with an engaged session).

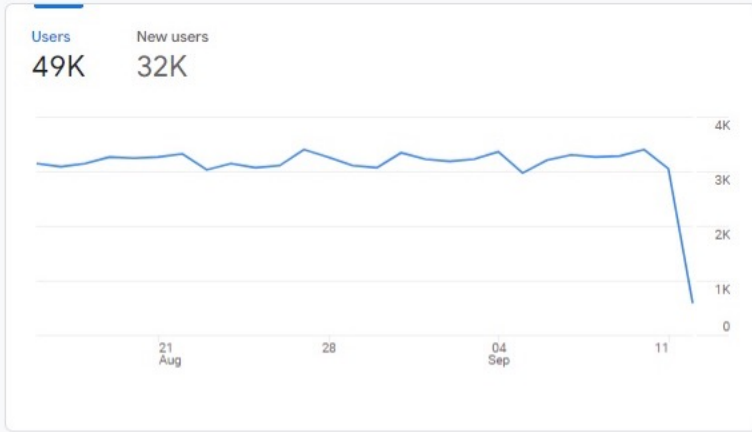
Other key differences

Cookies

There are some misconceptions floating around online that GA4 does not use data from cookies, it does. However, unlike Universal Analytics which was entirely reliant on cookies for analytics and remarketing, GA4 uses a system of blended signals to identify and track users. If we assign users with our own ID, these can also be passed to GA4.

GA4 utilises data from 1st party cookies (where available) as well as Google logged-in user data in Google Signals. In cases where neither cookies nor Signals are available, GA4 can fall back on modelled data which exploits machine learning to tie together and attribute events to anonymous users.

- Games reporting
- Life cycle
- Acquisition
 - Overview
 - User acquisition
 - Traffic acquisition
- Engagement
- Monetization
- Retention
- User
 - Demographics
 - Tech



New users by First user default ch...

FIRST USER DEFAU...	NEW USERS
Direct	27K
Paid Search	2.8K
Organic Search	2.3K
Unassigned	21
Referral	3
Organic Social	1

Sessions by Session default chan...

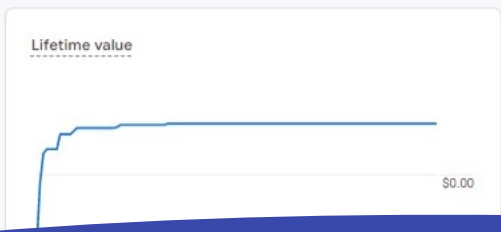
SESSION DEFAULT ...	SESSIONS
Direct	74K
Paid Search	30K
Unassigned	21K
Organic Search	4.5K
Referral	3
Organic Social	1

Sessions by Session Google Ads ...

SESSION GOOGLE ...

SESSIONS

No data available

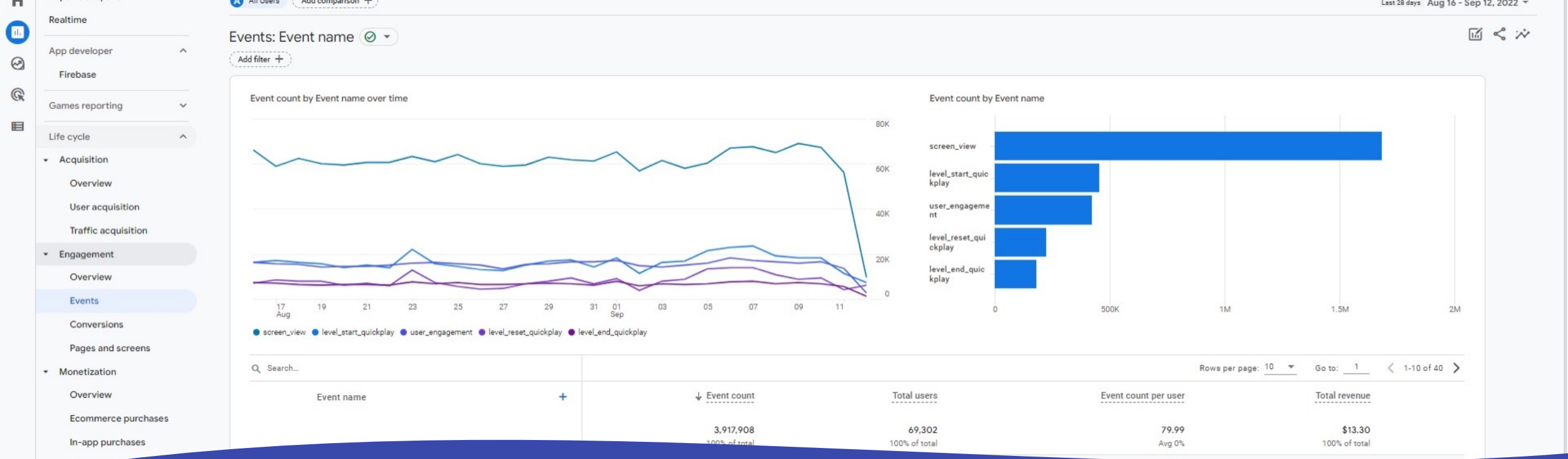


Living within the **Life Cycle** report Collection, the Acquisition section is likely to be one of the more familiar group of reports for regular Universal Analytics users.

Reports: Acquisition

This section consists of three reports: **Overview**, **User Acquisition** and **Traffic Acquisition**.

Here we can find information about the channels, mediums and campaigns that drove users to our website. As with all things in GA4, we can not only see our basic engagement metrics, but we are also able to see which events and conversion events were triggered from each of our acquisition channels. For example, if we have an event 'Applied for Programme' marked as a conversion (more on this later), we can at a glance see which channels drove that conversion.

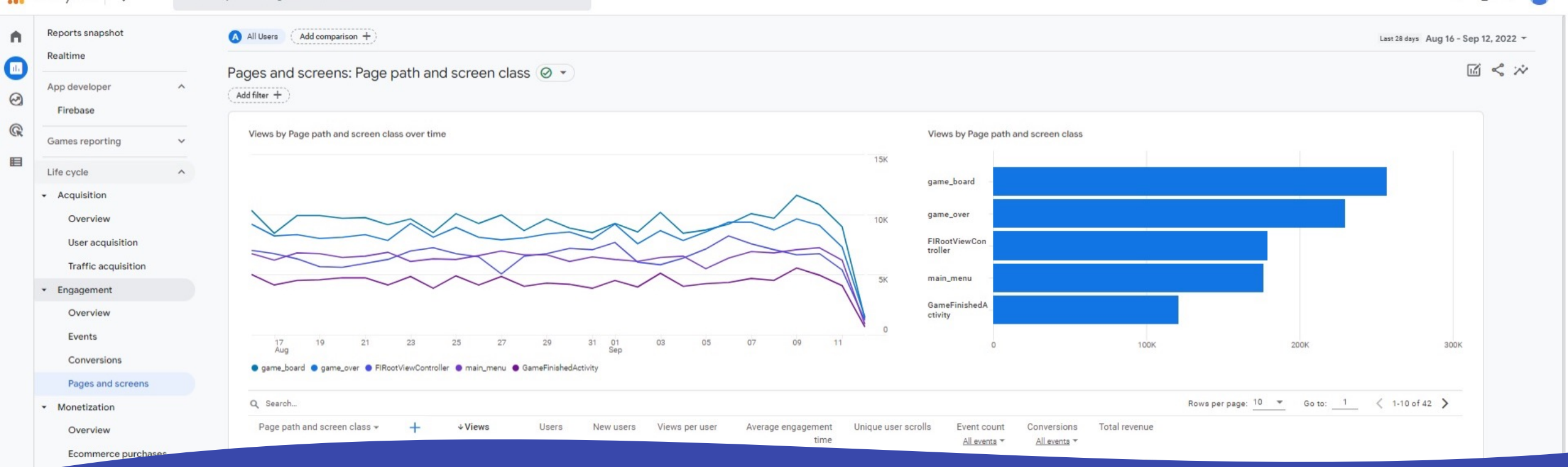


Reports: Engagement

The Engagement section of GA4 is somewhat analogous to the Behaviour section of Universal Analytics. This time, however, the primary focus is events rather than pages.

This section consists of: **Engagement Overview**, **Events**, **Conversions**, and **Pages and Screens**.

As mentioned previously, conversions are a big feature of GA4. Unlike UA where each conversion was set as a Goal (viewed a page or triggered an event), in GA4 any event can be marked as a conversion with the flip of a toggle. For both events and conversions, we can see how many were triggered and how many users triggered them.

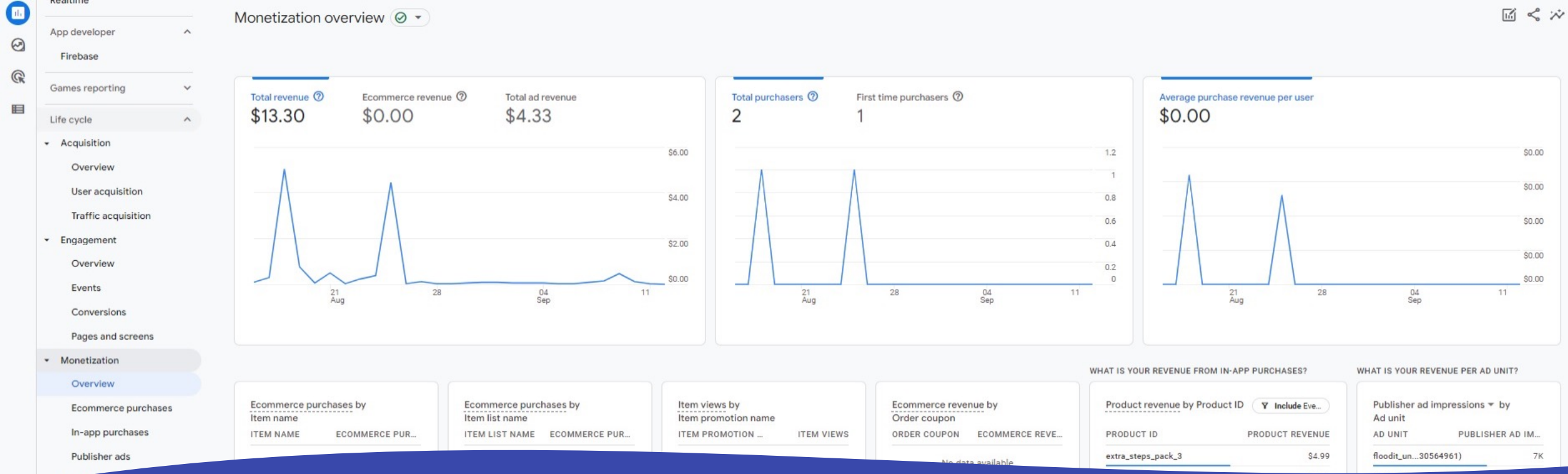


Reports: Engagement

Universal Analytics gave us a lot of focus on pages, with the All Pages, Landing Pages and Content Drilldown reports. GA4, on the other hand, puts much less emphasis on pages.

Within the Engagement section we have the **Pages and Screens** report. This is our one-stop-shop for analysing pageviews (Views in GA4) and landing sessions (the Session_Start event in GA4). If, like us, you have a website with pages numbering in the thousands or millions, one of the first things that you will notice is the '(other)' grouping.

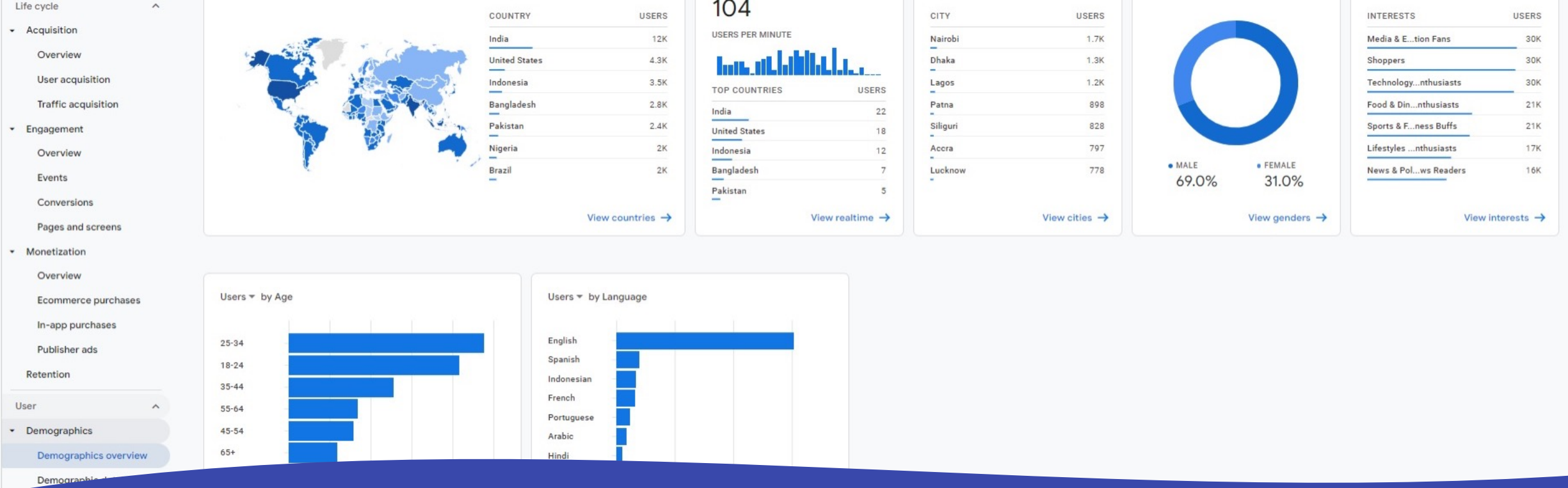
An important point to note is that while GA4 does not sample data like UA, it does employ **cardinality** to reports. Fortunately, there are a couple of ways to avoid this. One option is to enable the Google BigQuery export and report from there using a tool like Google Data Studio – but this comes with associated costs and technical requirements. The other option is to use GA4's report customisation function and build yourself a Landing Pages and/or All Pages report. A guide to which is [here](#).



Reports: Monetization

The third and final section in the in the Life Cycle Collection is Monetization. This section is focussed on e-commerce websites and apps, and contains the reports; **Overview**, **Ecommerce Purchases**, **In-app Purchases** and **Publisher Ads**.

As someone who doesn't work within the ecommerce sector, I don't spend an awful lot (or any) time in this section. However, if you do have any areas of your website which are monetised via purchases, GA4 includes several ecommerce specific events preconfigured out of the box. It is only necessary to ask your web development team to configure certain required parameters to be available to GA4 in the **Data Layer**, then Google can detect and trigger these events. For more information on how to do this, see [Google's guide](#).



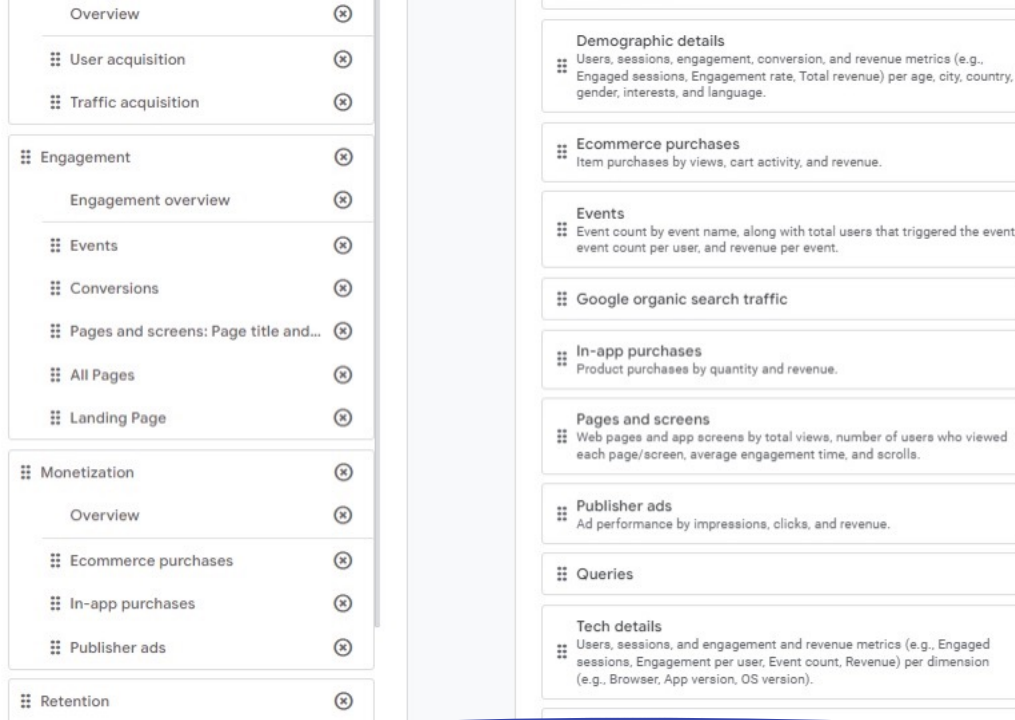
Reports: Demographics & Tech

Before we move away from the standard reporting suite of GA4 and talk more about custom reporting, we'll finish with a brief intro to the **User report Collection**.

This grouping consists of two sections; **Demographics** and **Tech**. Demographics is where we can find information on which countries, cities, languages, age, genders and interests are driving traffic and engagement on our website. Please note though, that in order to see (some) information on age and gender, you will have to enable **Google Signals** in Admin > Property > Data Settings > Data Collection.

The Tech section is where we can find information on devices, browsers and operating systems. Again, being GA4, we can also see which events and conversions these categories are generating.

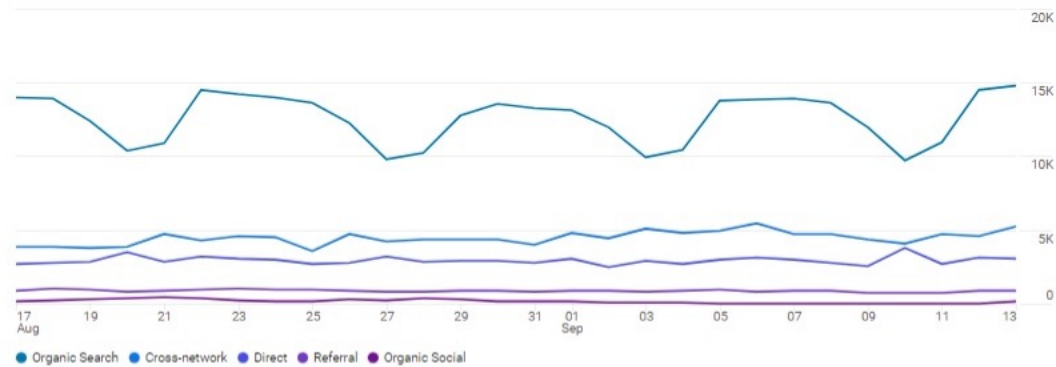
Report Library



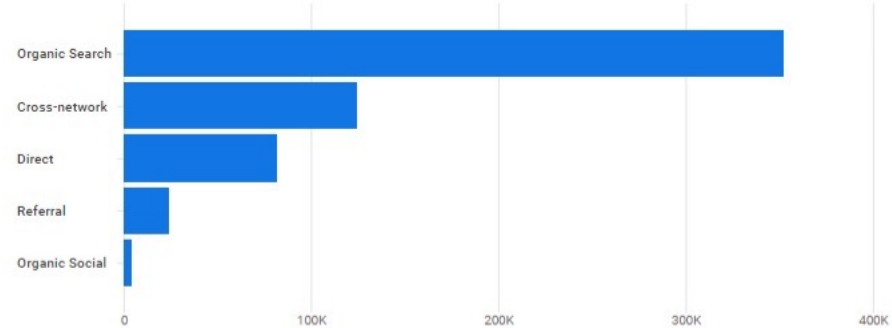
While the standard group of reports in GA4 might look rather small compared to Universal Analytics, one of the neat features of GA4 is that you can add and customise reports to meet your specific needs. Say hello to the Library.

Here we can see and customise our Collections. These are the groupings of reports in the left menu (Life Cycle and User by default). When we create a new custom report, we can add it to an existing Collection or even create a new one from scratch. New reports within Collections or new Collections themselves can be made visible to all users added to the GA4 Property, although only users with Admin access can do this.

New users by first user default channel grouping over time



New users by first user default channel grouping



Search...

Rows per page: 10 1-8 of 8

First user default channel grouping	New users	Engaged sessions	Engagement rate	Engaged sessions per user	Average engagement time	Event count	Conversions	Total revenue
Totals	587,424 100% of total	584,067 100% of total	67.61% Avg 0%	0.89 Avg 0%	1m 44s Avg 0%	14,061,041 100% of total	278,159.00 100% of total	£0.00
1 Organic Search	352,091	405,585	74.96%	1.03	2m 06s	9,812,270	191,229.00	£0.00
2 Cross-network	124,572	74,493	47.81%	0.57	0m 39s	1,450,835	22,558.00	£0.00
3 Direct	81,890	74,800	59.05%	0.79	1m 40s	2,011,212	44,877.00	£0.00
4 Referral	23,951	23,951	100%	1.00	1m 54s	694,188	17,562.00	£0.00
5 Organic Social	10,000	10,000	100%	1.00	1m 54s	694,188	17,562.00	£0.00

REPORT FILTER

+ Add filter

CHARTS

Line Chart

Bar Chart

REPORT TEMPLATE

User acquisition

SUMMARY CARDS

New users by

First user default chann...

New users by

First user default chann...

+ Create new card

Report Library

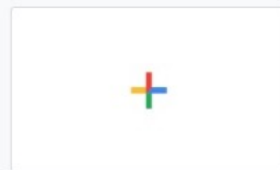
When it comes to new custom reports, we have *lots* of options. First and foremost, GA4 asks us whether we would like an overview report or a detailed report. Overview reports consists of cards, with each card calling out the headline figures for a specific metric. These reports can be really useful for quick and digestible summaries.

If we need more details we can, unsurprisingly, opt for a detailed report. Here we have a few quick templates to choose from to get us started, however, if these are not relevant, we can opt to start from scratch. In this configuration, we can choose which dimensions and metrics to include, as well as any charts, tables or filters are relevant.

There is too much here to go into great detail, but there are plenty of great resources on YouTube from folks like Analytics Mania.

Explorations

Start a new exploration



Blank

Create a new exploration



Free form

What insights can you uncover with custom charts and tables?



Funnel exploration

What user journeys can you analyze, segment, and breakdown with multi-step funnels?



Template gallery NEW

Path exploration

What user journeys can you uncover with tree graphs?

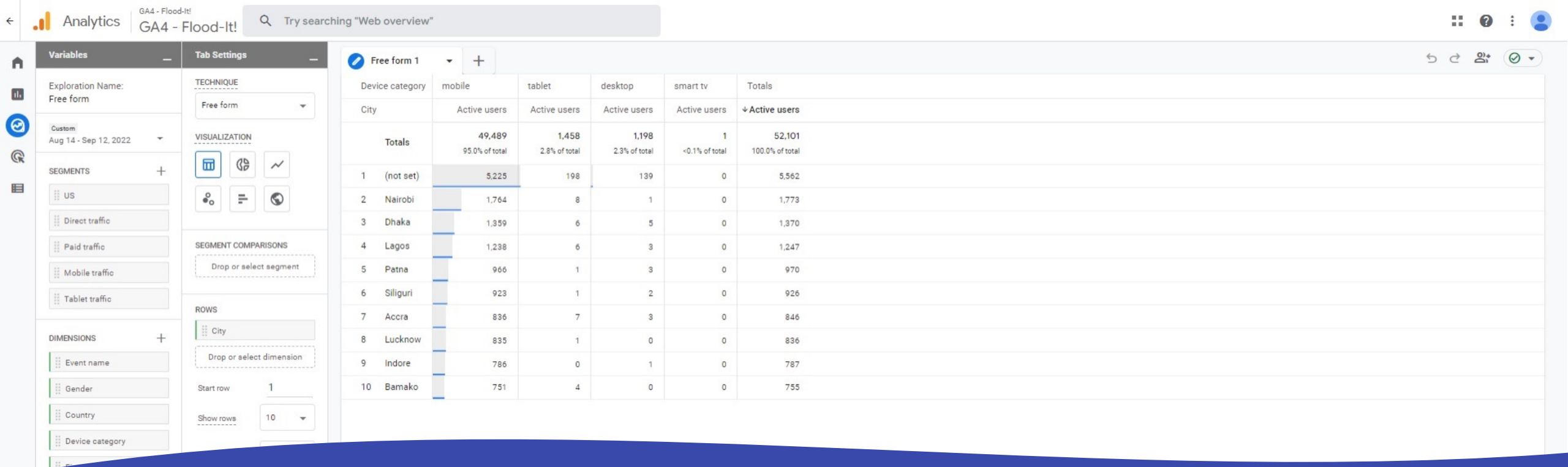
Type	Name ↓	Owner	Last modified ↓	Property	Q
	Free form	Jack Taylor	4:03 PM	GA4 - Flood-It!	

Explorations

Having talked about custom reports and Collections, I am now going to confuse matters by talking about Explorations. At first glance, reports and explorations serve very similar purposes, but there are a few key differences.

According to Google, *“Explorations is a collection of advanced techniques that go beyond standard reports to help you uncover deeper insights about your customers' behavior”*.

Explorations are intended for quick ad-hoc queries, allowing you to easily switch, combine and filter metrics and dimensions, with more options to visualise the results than are supported in standard reports.



Explorations

When you create a new Exploration, you will find a report editor not dissimilar to a pivot table in Microsoft Excel.

On the left you have your list of variables. These are the dimensions, metrics and segments that you can use in your analysis. By default, there may only be a couple of each included (e.g. Date, Total Users and Active Users), however, you can add new ones using the + symbol. It is worth noting that this includes any custom dimensions and metrics that you have added, but we'll talk more about that later.

Next, we have our tab settings. We can choose how we would like to visualise the data, be that a table, chart or map. Then we can choose which of our dimensions and metrics to include and apply any filters that are required.

Explorations

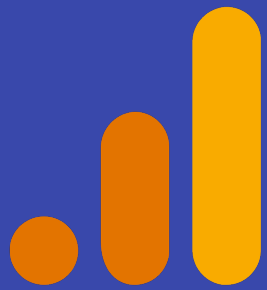
This is probably one of the most confusing sections for those new to GA4, however, it can be very useful. So, let's look at an example.

Let's say that we are running PPC campaigns in Google Ads and what to know how those users are engaging with the website.

On the variables menu, we can add the dimensions Event Name and Session Campaign. For metrics, we can add Event Count and Total Users. From here, we can build ourselves a pivot table showing which events were triggered by each campaign, and how many users and events that represents.

To do this we would drag Event Name to ROWS, Session Campaign to COLOUMNS and Event Count and Total Users to VALUES.

Explorations



There are a few important things to note with Explorations in GA4.

- Unlike reports, Exploration can include multiple tabs, each with their own data, filters and visualisations. Think of this like its own little analytics microsite.
- While you can select the date range for your Exploration in the Variables menu, you are limited to the look-back window set by your data retention settings. By default, GA4 only stores cookie based granular data for two months, and otherwise relies on aggregated data. This is fine for standard reports, but Explorations will be limited as they use cookie data. To change this, head to Admin > Property > Data Settings > Data Retention. Retention can be changed to 14 months maximum.
- Exploration can be kept as personal to you or shared with all users (not individual users).

Analytics | All accounts | Try searching "how to activate Google signals" | 17/17 conversion events | Reporting time = Conversion... | Add filter + | Last 28 days | Aug 17 - Sep 13, 2022

Advertising snapshot | Attribution | Model comparison | Conversion paths

Model comparison

Search...		Attribution model (non-direct) Cross-channel last click model		Attribution model (non-direct) Cross-channel data-driven model		% Change	
Default channel grouping +		Conversions	Revenue	Conversions	Revenue	Conversions	Revenue
		34,731 100% of total	\$8.97 100% of total	34,731.00 100% of total	\$8.97 100% of total	0%	0%
1	Direct	29,134	\$8.97	29,134.00	\$8.97	0%	0%
2	Paid Search	4,307	\$0.00	4,307.00	\$0.00	0%	0%
3	Organic Search	1,271	\$0.00	1,271.00	\$0.00	0%	0%
4	Unassigned	19	\$0.00	19.00	\$0.00	0%	0%

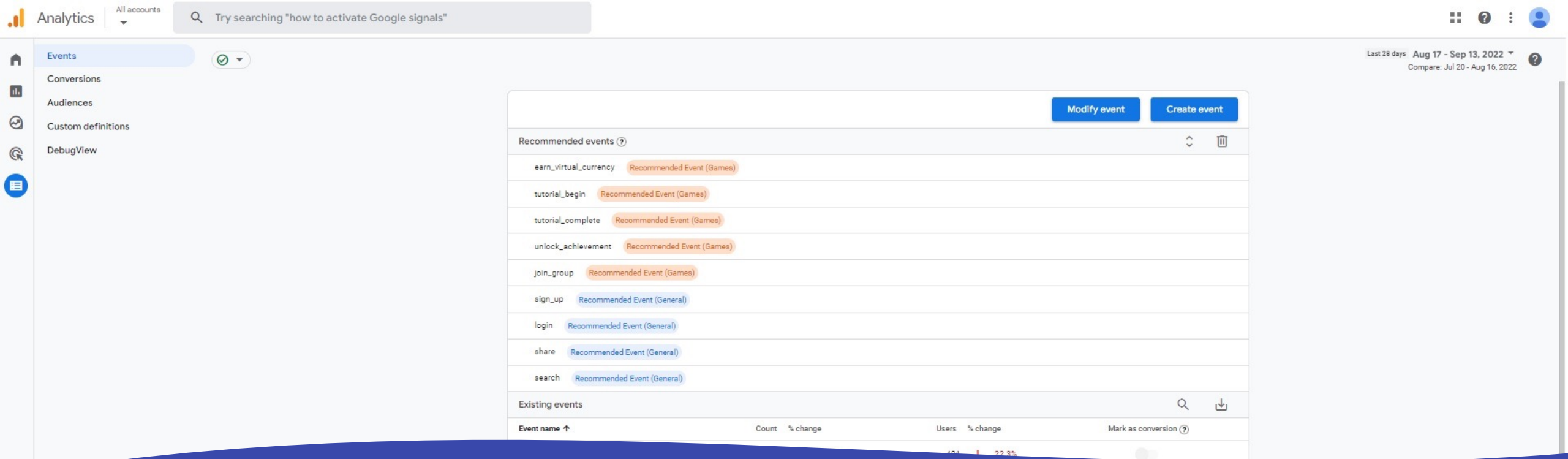
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Advertising

Those of us who generate website visits and conversions from multiple channels, such as organic, paid and referral, might be familiar with the Conversions reports in Universal Analytics. If so, worry not, as GA4 takes attribution modelling and turns it up a notch.

Within the Advertising section, we can explore attribution models and which touch-points – or combination of touch-point – are driving conversions. Where GA4 improves on UA is the inclusion of data-driven modelling.

Rather than limiting attribution to single model such as first or last click, GA4 uses AI and machine learning to generate the data-driven model. This uses machine learning to study both converting and non-converting paths and learns which combinations of touchpoints generate conversions.



Configuration

The final section to cover on the front-end of GA4 is the Configuration section. This is where we can see and manage all of our **Events**, **Conversions**, **Audiences** and **Custom Definitions**.

Events

Within the Events section we can see all of the active events in GA4. This will include all default or preconfigured events, as well as any custom events that we might be sending via Google Tag Manager etc. It is here that we have the option to modify any incoming events, for example renaming a non-user-friendly value ('AppFormSubmitted' could be dynamically renamed to 'Application Submitted').

Conversion Events		Network Settings				
Conversion name ↑	Count	% change	Value	% change	Mark as conversion ?	
add_to_cart	0	0%	0	0%	<input type="checkbox"/>	
add_to_wishlist	0	0%	0	0%	<input type="checkbox"/>	
app_store_subscription_convert	0	0%	0	0%	<input type="checkbox"/>	
app_store_subscription_renew	0	0%	0	0%	<input type="checkbox"/>	
app_update	498	↓ 17.0%	-		<input type="checkbox"/>	
begin_checkout	0	0%	0	0%	<input type="checkbox"/>	
completed_5_levels	0	0%	0	0%	<input type="checkbox"/>	
ecommerce_purchase	0	0%	0	0%	<input type="checkbox"/>	
first_open	31,102	↓ 10.4%	-		<input type="checkbox"/>	
in_app_purchase	3	↓ 62.5%	\$8.97	↓ 75.0%	<input type="checkbox"/>	
level_complete	3,122	↓ 10.4%	53	↑ 10.4%	<input type="checkbox"/>	
organic	0	0%	0	0%	<input type="checkbox"/>	
purchase	0	0%	0	0%	<input type="checkbox"/>	

Configuration

Conversions

Here we can manage all of our conversion events. Events can be marked as conversions within the Events tab, or create and turned on/off in the Conversions section. We can also view any networks that our conversions are being shared across, such as Google Ads, Google Ad Manager, Search Ads 360 or DV360 – assuming that we have connected these products in the Admin section. However, we will cover this in the next section.

Audiences

Audiences in GA4 can be thought of as Universal Analytics **Segments** and **Audiences** all rolled into one. Audiences can be used in reports across GA4 and are automatically shared with any connected products such as Google Ads, allowing for remarketing activity.

Audience name	Description	Users (?)	% change	Created on ↓
Crashing Users	Users who experience a fatal exception	716	↑ 3.8%	Nov 1, 2016
Level Beaters_v2	Users who have completed at least one progressive level	13,021	↓ 0.8%	May 14, 2016
Expert Users	Users who have beaten all progressive levels	260	↓ 6.5%	May 14, 2016
Intermediate Users	Users who have completed the first 10 progressive levels	1,153	↓ 3.0%	May 14, 2016
Level Beaters_v1	Users who have completed at least one progressive level	12,370	↓ 0.9%	May 14, 2016
Extra Steps Users	Users who have used extra steps	5,556	↓ 0.5%	May 14, 2016
All Users	All users	49,400	↓ 7.4%	May 11, 2016
Purchasers	Users who have made a purchase	36	↑ 5.9%	May 11, 2016

Configuration

Unlike Universal Analytics, where both Segments and Audiences were somewhat simplistic in their definition and scope, GA4 audiences can be configured to segment users on very specific conditions.

GA4 Audiences can target information about users (age, country, city, browser, device etc.) events, or dimensions - including custom dimensions. Audiences can contain multiple and/or conditions, as well as now supporting sequences and timings.

For example, we could create an audience based on users who arrive via a specific referral channel, view a programme page, scroll all the way to the bottom of that page, and then within 30 minutes complete an enquiry form.

DebugView

Dimension name ↑	Description	Scope	User Property/Parameter	Last changed
Ad ID		Event	ad_id	May 17, 2022
Chat to Student Provider		Event	chat_to_student_provider	May 17, 2022
CT Tag		Event	ct_tag	May 17, 2022
Department ID		Event	department_id	May 17, 2022
Department Name		Event	department_name	May 17, 2022
FAU User ID		Event	fau_user_id	May 17, 2022
Institution ID		Event	institution_id	May 17, 2022
Institution Name		Event	institution_name	May 17, 2022
Interaction Type	The interaction type initiated by the user which triggered the event.	Event	interaction_type	May 17, 2022
Page Author		Event	page_author	May 17, 2022
		Event	page_category	May 17, 2022

Configuration

Finally, within the Configuration section, we have the **Custom Definitions** tab.

Custom Definitions cover both custom dimension and custom metrics. While Universal Analytics allowed us to create custom dimensions and metrics, we were limited in the number of each allowed and this often required input from web developers to implement. Not so with GA4.

If we choose to send custom events to GA4, these events will have associated parameters. For example, our example 'Application Submitted' event mentioned earlier may pass parameters including things like Programme Name, Department Name, Programme, Mode of Study or Start Term.

Configuration

Event parameters on their own are not widely available across GA4 reports. However, in the Configuration > Custom Definitions tab, we can easily use these parameters to create custom dimensions.

To do this, we click on 'Create Custom Dimensions' button, specify the source event that we would like pull the parameter from (e.g. 'Application Submitted'), and then specify the parameter that we would like to turn into a dimension (e.g. 'Field of Study'). Hey presto, we now have a custom dimension that we can use anywhere in GA4!

The screenshot shows the 'New custom dimension' configuration interface. At the top right is a 'Save' button. A yellow warning banner contains a triangle icon and the text: 'Registering a dimension with a high number of unique values may negatively impact your reports. Learn more about best practices. Be sure to follow best practices for custom dimension setup.' Below the banner, the 'Dimension name' field contains 'Application Submitted' and has a lock icon. The 'Scope' dropdown is set to 'Event'. The 'Description' field is empty. The 'Event parameter' dropdown is open, showing a list of options: 'campaign', 'click_url', 'content', 'content_group', and 'engagement_time_msec'.

Settings & Options

The Admin section of GA4 can seem a bit intimidating at first, and there are too many settings to mention in this guide, yet it is still worth talking about a few of the more useful or critical settings.

The first thing to notice in GA4 is that we no longer have the option of creating multiple views within a Property. What would have been segmented using Views in UA can now be achieved in GA4 using filters, audiences, segments or Data Streams.

The other sections of Admin share similarities with Universal Analytics, only with more options, greater flexibility and a stronger focus on privacy settings.

Settings & Options

GA4 - Flood-It! (153293282)

Property Settings

Property details

PROPERTY ID
153293282

Property name
GA4 - Flood-It!

Industry category
Select one

Reporting time zone
United Kingdom (GMT-07:00) GMT-07:00

Currency displayed as
US Dollar (USD \$)

Property Settings

Here we can find the basic settings for our website/company, such as name, industry, time zone and currency settings.

Property Access Management

This is where Property by Property user access can be controlled. As with UA, any users granted access at the Account level will automatically inherit access to each Property created under that Account. User roles now include Viewer, Analyst, Editor and Administrator. Unique to GA4, we also have control over whether any user role under Admin level can view cost or revenue data (if being sent).

Settings & Options

The screenshot shows the GA4 Admin interface. At the top, a green notification bar states: "Data collection is active in the past 48 hours." Below this is the "Stream details" section, which contains a table with the following information:

STREAM NAME	STREAM URL	STREAM ID	MEASUREMENT ID
Flood-It! Web	http://flood-it.app	2198273707	G-QCX3G9KSPC

Below the stream details is the "Events" section, which includes the "Enhanced measurement" toggle, currently turned on. The text below the toggle reads: "Automatically measure interactions and content on your sites in addition to standard page view measurement. Data from on-page elements such as links and embedded videos may be collected with relevant events. You must ensure that no personally-identifiable information will be sent to Google. [Learn more](#)".

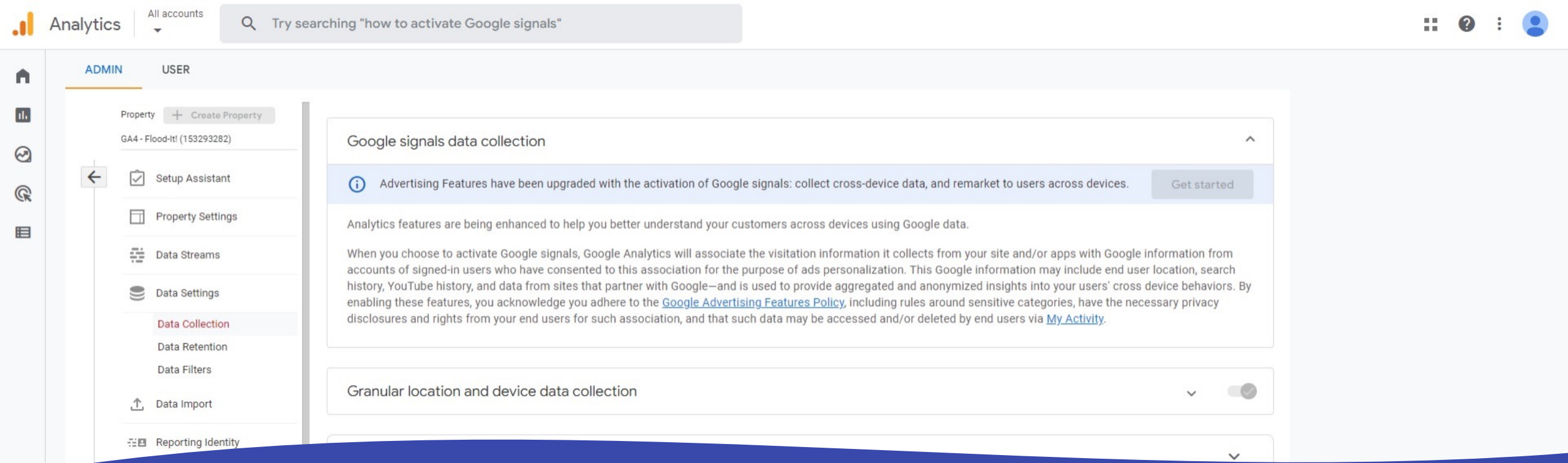
At the bottom of the "Events" section, there is a "Measuring:" section with three active items: "Page views", "Scrolls", and "Outbound clicks", followed by a "+ 1 more" link and a settings gear icon.

Data Streams

In GA4, Data Streams are where we manage connections to our analytics tag or tags, otherwise known as our Google Tags. Typically, a website will only require a single Data Stream, configured and setup when we create a new GA4 Property. For websites who have a corresponding mobile app, Data Streams will be needed for each Android or iOS app.

Data Streams have lots of settings that we won't delve into here, but there are a few important settings to consider. The first are **Enhanced Measurements**. Here we can opt to automatically collect events such as page scrolls and file downloads, plus we can configure the parameters for our website search tool (if used).

The other key thing in Data Streams is the Measurement ID. This important to be able to locate when setting up tracking in tools like Google Tag Manager.



Settings & Options

Data Settings

Next up we have the Data Settings section. Here we can configure out **Data Collection**, **Data Retention** and **Data Filters**.

Under the Data Collection header, make sure that you enable Google Signals. This allows Google to use information it knows about users from their logged-in state (Google Account), helping to match-up cross device traffic, as well as sharing age, gender and interest data.

Under Data Retention, this is where we can change the default 2 months of data retention to 14 months, expanding the usefulness of Explorations.

Finally, Data Filters let us block things like internal traffic from being counted.

Settings & Options

Product Links

Finally, the Product Links section is where we can associate our GA4 Property with any other Google service that we use and that we would like to share data between.

GA4 product integration across other Google services is much more robust than we are used to in UA. Tools such as Google Ads and Google Optimize can automatically pull audience, event and conversions data from GA4 once linked, without any additional configuration.

The BigQuery Links tool is also new to GA4. It allows us to connect our GA4 to Google BigQuery to back-up and store all our analytics data, in full and unsampled. This does, however, incur additional storage and querying costs.



Setup Assistant

Property Settings

Data Streams

Data Settings

Data Collection

Data Retention

Data Filters

Data Import

Reporting Identity

PRODUCT LINKS

Google Ads Links

Ad Manager Links

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Link

Project ID	Project name	Project number	
adh-demo-data-review	Demoverse	201747119887	>



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Any questions, email:

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