

TikTok Infringes US Patent No. 8,145,704

NTECH Properties, Inc. (“NTECH”) provides the following chart pursuant to Patent Local Rule 3-1 regarding ByteDance Ltd., ByteDance Pte. Ltd., and TikTok Pte Ltd. (collectively “Defendants” or “TikTok”) infringement of U.S. Patent No. 8,145,704 (the “’704 Patent”).

As identified and described element-by-element below, TikTok infringes claims 1-3, 7, 10. 14-24 of the ’704 Patent (the “Asserted Claims”). Elements in these claims can be met with source code and/or combinations of source code and hardware.

None of the elements of the Asserted Claims of the ’704 Patent are governed by 35 U.S.C. §112(6).

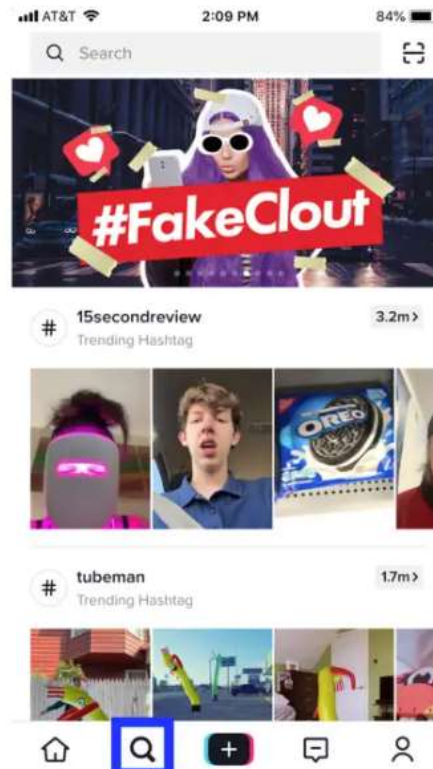
Claim 1

1a. A method of generating media programming for display on a client, comprising:

The Accused Instrumentalities generate media programming including video, audio, music, images and advertisement. This content can be generated on TikTok Servers, the TikTok Website, or the TikTok App. The content is displayed on the client used by the customer, including on the TikTok App or through the TikTok Website.

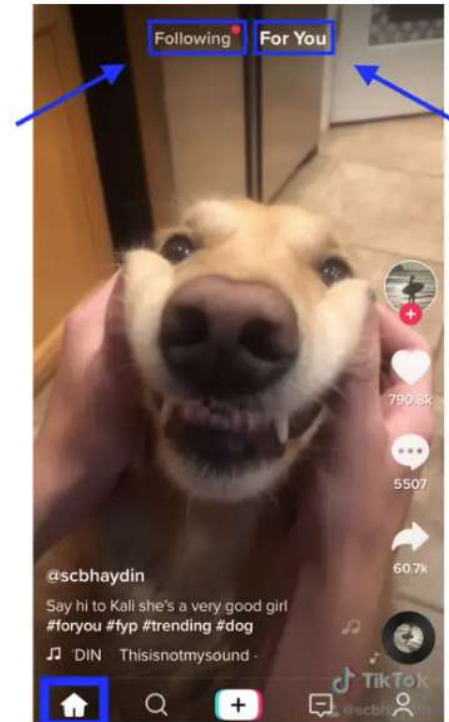
The below excerpts depict different examples for how the Accused Instrumentalities display different content and displays this content to a user through a client.

The second tab in the menu running across the bottom of TikTok, represented by a magnifying glass, is where you'll find what's trending on the app. This is TikTok's bread and butter: it's where the latest viral trends are found, and associated hashtags are tracked.



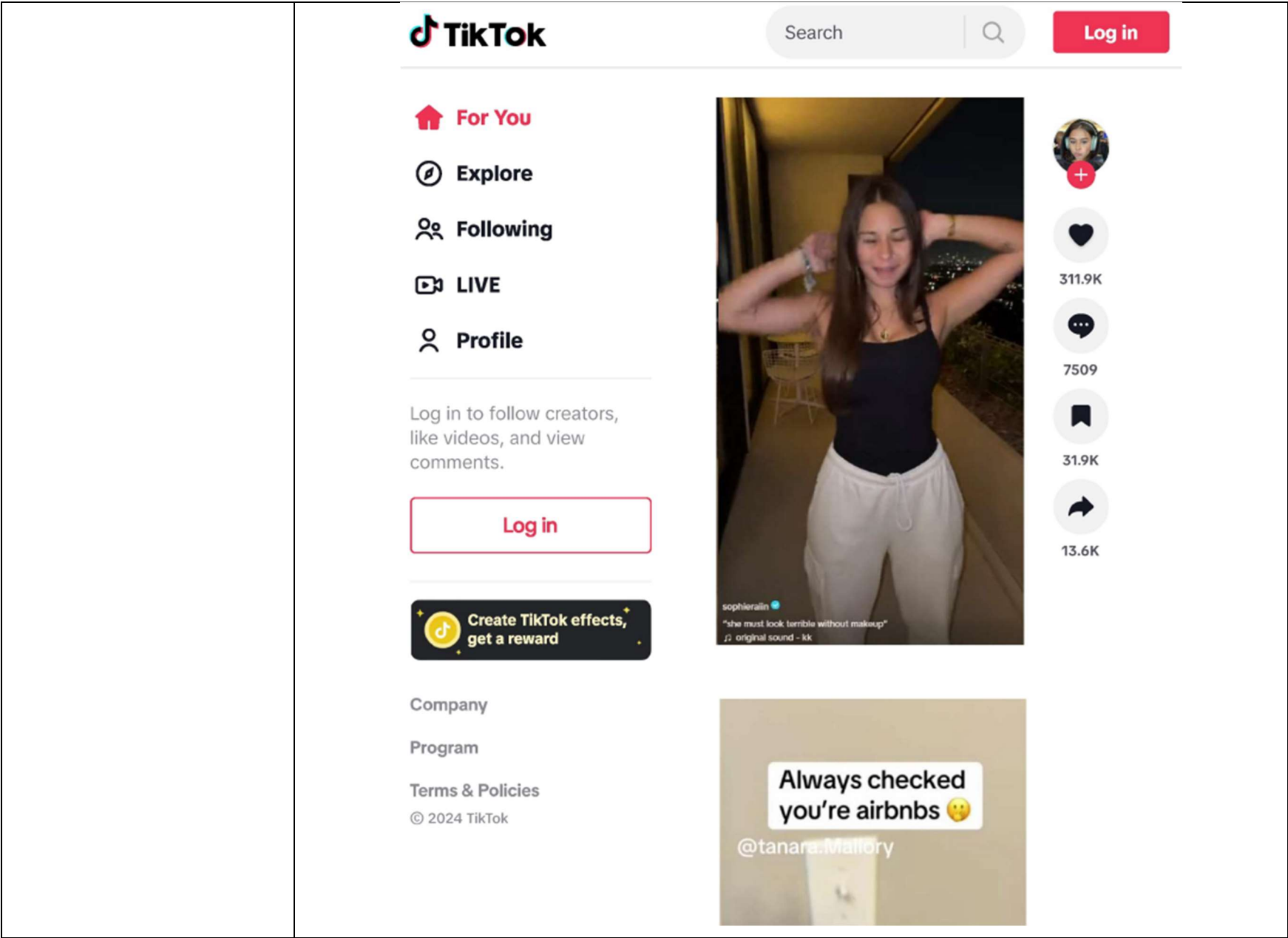
TikTok/Business Insider

The TikTok home page, where your feed lives, is split up into two sections: "following," to only see content from users you follow, and "for you," which amasses popular content from across TikTok, similar to Instagram's Explore page.

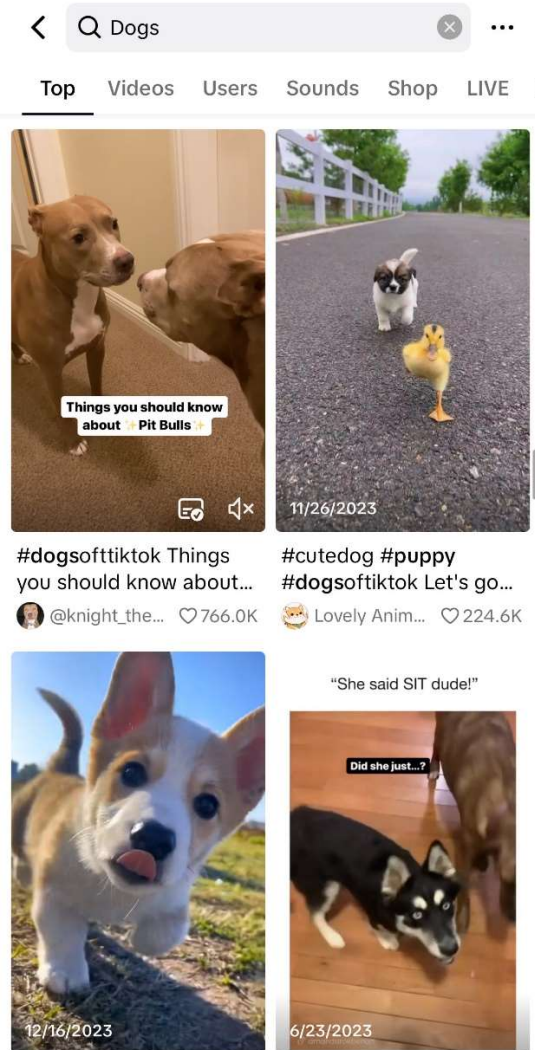


TikTok/Business Insider

NTECH 002202 - NTECH 002225 at NTECH 002205, 2207 (showing media programming generated within the TikTok App and displayed on a mobile phone)



NTECH 002631-NTECH 002632 (Showing media programming generated within the “For You” feed on the TikTok Website and displayed on a computer)



NTECH 002274 (showing media programming generated within TikTok's search feed on a mobile phone)

-  **For You**
-  **Explore** New
-  **Following**
-  **LIVE**
-  **Profile**

Log in to follow creators,
like videos, and view
comments.

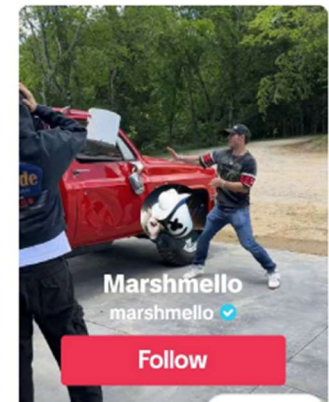
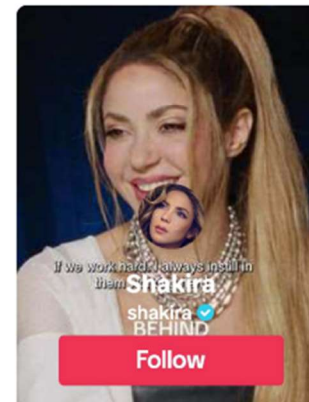
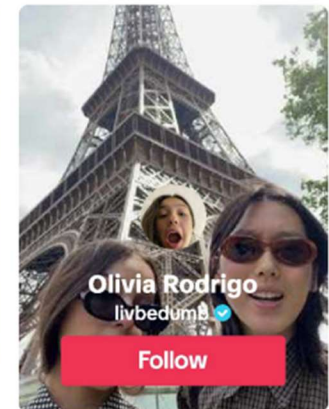
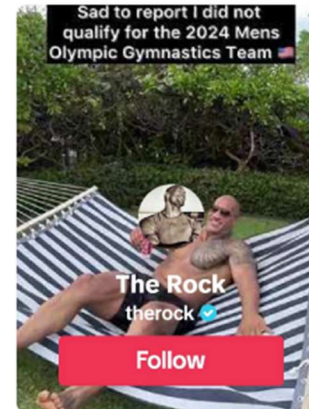
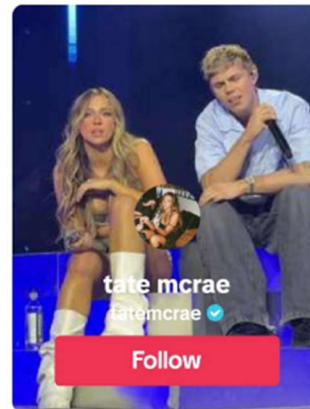
[Log in](#)

 **Create TikTok effects,
get a reward**

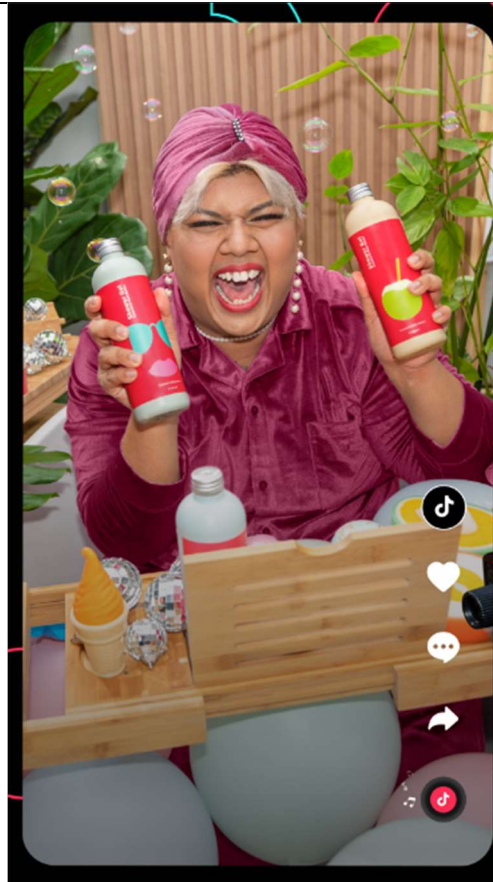
[Company](#)

[Program](#)

[Terms & Policies](#)



NTECH 002301-NTECH 002306 (Showing media programming generated within the "Following" feed on TikTok Website and displayed on a computer)



	 TikTok for Business Grow your Business with TikTok ads TikTok Ads Manager is the one-stop shop for running and managing paid campaigns on TikTok. TikTok Ads Manager gives you all the features you need to launch effective ads, drive sales and measure performance. Best of all, it's affordable and easy to use. NTECH 002564-2567 (Showing TikTok for Business webpage, providing directions on how to post and pay for advertisement on the Accused Instrumentalities) As described below, a user can watch content, such as TikTok video's, on a client through the TikTok App or the TikTok Website.
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	Watching TikTok videos In a nutshell, like videos from Vine or Instagram, TikTok videos appear vertically on your screen. You can engage with them using "hearts", which are the same as "likes." After you download the TikTok app and open it, you'll immediately see curated featured videos on the "for you" page. You can switch to the "following" page to see videos from users you follow - whether friends or popular TikTokkers. NTECH 002624- NTECH 002630 (https://www.pocket-lint.com/what-is-tiktok/ article explaining how TikTok is used)
1b. receiving by an aggregator data relating to a plurality of media streams;	The Accused Instrumentalities operate aggregators which receive data regarding different media streams when it collects, stores and interprets data via the TikTok Servers. TikTok's aggregators are TikTok's servers powering its recommendation engine i.e frontend servers and backend servers or a combination of both (TikTok's frontend and backend server include TikTok's web servers, application servers and database servers). TikTok's aggregators, use Web and App HTTP based API's and RESTful API's to provide presentation elements with different feeds to the user. These API's receive and transfer user information and selections from a mobile device or computer, from TikTok's frontend application interface/website interface. TikTok's backend servers, including software supporting the TikTok App and Website, receive this user selection. The aggregators of the Accused Instrumentalities operate in different processing and storage servers controlled by TikTok, including through cloud servers and databases using TikTok's cloud infrastructure, Oracle's U.S. Cloud infrastructure, Google Cloud, AWS, and/or Alibaba Cloud. As described in the excerpt below, TikTok Servers operate aggregators that receive data when it collects data tracking user behavior and connected to the different content by the user (e.g. the TikTok videos viewed).

	In comparison to other popular social media platforms, TikTok collects similar types of data to track user behaviour and serve targeted ads. TikTok collects information about your device (model, serial numbers, etc.) and your usage patterns. Some of the collected information is sent directly to TikTok servers while some is first sent to third parties such as Facebook and Google. TikTok also tells Facebook about the specific posts that you have viewed and whenever you like a post or follow a user. All of this information allows TikTok and their partners to learn about your interests and behaviour. When combined with information collected through other means and channels, TikTok and their partners may be able to track your viewing history across different platforms. NTECH 002244 – NTECH 002249 (TikTok’s USDS article describing the type of data stored on its servers) Data Storage for U.S. Users As of July 2022, all new U.S. user data is stored automatically in Oracle's U.S. Cloud infrastructure, and access is managed exclusively by the TikTok US Data Security team. USDS is dedicated to making every U.S. user on TikTok feel safe and confident their data is secure and that the platform is free from outside influence. To help ensure that there is no unauthorized access to our systems, such as no "backdoors" or data leakage, Oracle and a third-party source code inspector will work to ensure that everything is performing as intended. NTECH 002028 (Stating TikTok’s use of Cloud servers to store data)
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The Cloud: Holding Up the TikTok Universe

The backbone of TikTok's global operations is cloud computing. By leveraging the cloud's immense scalability and flexibility, TikTok can support the storage and retrieval of billions of short videos, even during peak usage times.

s://medium.com/@entrustech/tiktok-the-magic-behind-the-screen-9346a5b718f4

2/9

/24, 11:41 AM

TikTok: The Magic Behind the Screen | by Entrustech Inc | Medium

But it's not just any cloud. TikTok uses a multi-cloud strategy involving services like Amazon Web Services (AWS), Google Cloud, and Alibaba Cloud, depending on the region. This strategy ensures there's no single point of failure and also lets TikTok abide by regional data laws.

NTECH 002018 – NTECH 00206 (Article describing TikTok's Cloud Server architecture)

As depicted by the excerpts below, TikTok's Servers and databases store data ranging from user information to media streams, also known as content on the TikTok App and the TikTok Website which takes the form of video, audio, music and images.

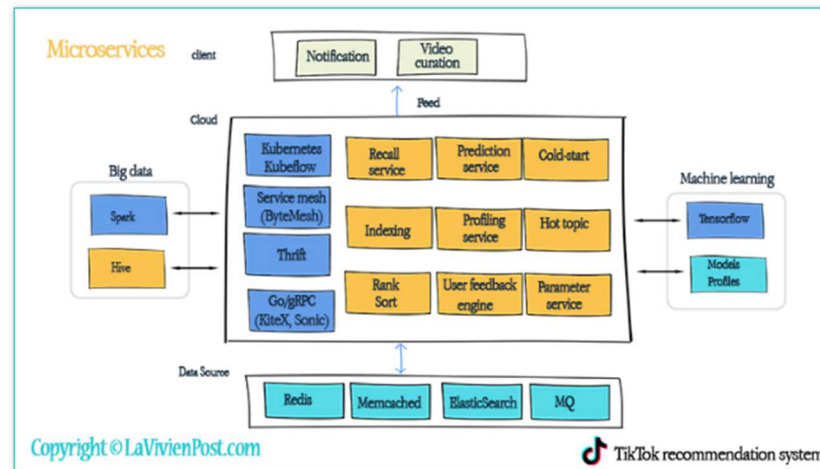
	We may collect information from and about you, including information that you provide, information from other sources, and automatically collected information. Information You Provide When you create an account, upload content, contact us directly, or otherwise use the Platform, you may provide some or all of the following information: • Account and profile information, such as name, age, username, password, language, email, phone number, social media account information, and profile image. • User-generated content, including comments, photographs, livestreams, audio recordings, videos, text, hashtags, and virtual item videos that you choose to create with or upload to the Platform ("User Content") and the associated metadata, such as when, where, and by whom the content was created. Even if you are not a user, information about you may appear in User Content created or published by users on the Platform. When you create User Content, we may upload or import it to the Platform before you save or post the User Content (also known as pre-uploading), for example, in order to recommend audio options, generate captions, and provide other personalized recommendations. If you apply an effect to your User Content, we may collect a version of your User Content that does not include the effect. • Messages, which include information you provide when you compose, send, or receive messages through the Platform's messaging functionalities. They include messages you send through our chat functionality when communicating with merchants who sell goods to you, and your use of virtual assistants when purchasing items through the Platform. That information includes the content of the message and information about the message, such as when it was sent, received, or read, and message participants. Please be aware that messages you choose to send to other users of the Platform will be accessible by those users and that we are not responsible for the manner in which those users use or share the messages. • Information, including text, images, and videos, found in your device's clipboard, with your permission. For example, if you choose to initiate information sharing with a third-party platform, or choose to paste content from the clipboard onto the Platform, we access this information stored in your clipboard in order to fulfill your request. • Purchase information, including payment card numbers or other third-party payment information (such as PayPal) where required for the purpose of payment, and billing and shipping address. We also collect information that is required for extended warranty purposes and your transaction and purchase history on or through the Platform. • Your phone and social network contacts, with your permission. If you choose to find other users through your phone contacts, we will access and collect information such as names, phone numbers, and email addresses, and match that information against existing users of the Platform. If you choose to find other users through your social network contacts, we will collect your public profile information as well as names and profiles of your social network contacts. • Your choices and communication preferences. • Information to verify an account such as proof of identity or age. • Information in correspondence you send to us, including when you contact us for support. • Information you share through surveys or your participation in challenges, research, promotions, marketing campaigns, events, or contests such as your gender, age, likeness, and preferences.
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	NTECH 002449 - NTECH 002467 (TikTok’s privacy policy describing the type of user data collected and stored within TikTok’s Servers and databases) User-Generated Content Users of the Services may be permitted to upload, post or transmit (such as via a stream) or otherwise make available content through the Services including, without limitation, any text, photographs, user videos, sound recordings and the musical works embodied therein, including videos that incorporate locally stored sound recordings from your personal music library and ambient noise (“User Content”). Users of the Services may also extract all or any portion of User Content created by another user to produce additional User Content, including collaborative User Content with other users, that combine and intersperse User Content generated by more than one user. Users of the Services may also overlay music, graphics, stickers, Virtual Items (as defined and further explained Virtual Items Policy ↗) and other elements provided by TikTok (“TikTok Elements”) onto this User Content and transmit this User Content through the Services. The information and materials in the User Content, including User Content that includes TikTok Elements, have not been verified or approved by us. The views expressed by other users on the Services (including through use of the virtual gifts) do not represent our views or values. NTECH 002034 - NTECH 002052 (TikTok’s privacy policy defining content on the TikTok App and the TikTok Website).
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	How We Use Your Information As explained below, we use your information to improve, support and administer the Platform, to allow you to use its functionalities, and to fulfill and enforce our Terms of Service. We may also use your information to, among other things, show you suggestions, promote the Platform, and customize your ad experience. We generally use the Information We Collect → : • To fulfill requests for products, services, Platform functionality, support and information for internal operations, including troubleshooting, data analysis, testing, research, statistical, and survey purposes and to solicit your feedback. • To customize the content you see when you use the Platform. For example, we may provide you with services based on the country settings you have chosen or show you content that is similar to content that you have liked or interacted with. • To send promotional materials from us or on behalf of our affiliates and trusted third parties. • To improve and develop our Platform and conduct product development. • To measure and understand the effectiveness of the advertisements we serve to you and others and to deliver advertising, including targeted advertising, to you on the Platform. • To make suggestions and provide a customized ad experience. NTECH 002449 - NTECH 002467 (TikTok help center article stating how user information is utilized, including to customize a sequence of content displayed on the TikTok App and the TikTok Website. This customization of content can also be referred to as a temporal sequence of media, known as a media stream)
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4. Microservices architecture

TikTok has embraced cloud-native infrastructure. The recommendation components such as user profiling, predictions, cold-start, recall, and user feedback engine are serving as APIs. The services are hosted in the cloud such as Amazon AWS and Microsoft Azure. As the outcome of the system, the video curation will be pushed to the users through the cloud.



NTECH 002605 - NTECH 002615 (Article describing the role TikTok's Cloud servers play in TikTok's client server architecture)

1c. accessing by the aggregator user information;

The Accused Instrumentalities access information about the user that is stored within TikTok Servers, the TikTok App, or the TikTok Website, and the aggregator accesses and use user information in the process of providing media streams. This data is accessed to determine the advertisements, videos and images to serve to the user.

As shown below, the Accused Instrumentalities collect data to track user behavior and then access this user data to serve content including targeted advertisements.

	In comparison to other popular social media platforms, TikTok collects similar types of data to track user behaviour and serve targeted ads. TikTok collects information about your device (model, serial numbers, etc.) and your usage patterns. Some of the collected information is sent directly to TikTok servers while some is first sent to third parties such as Facebook and Google. TikTok also tells Facebook about the specific posts that you have viewed and whenever you like a post or follow a user. All of this information allows TikTok and their partners to learn about your interests and behaviour. When combined with information collected through other means and channels, TikTok and their partners may be able to track your viewing history across different platforms. NTECH 002244 – NTECH 002249 (TikTok’s USDS article describing the type of data stored on its servers) Data Storage for U.S. Users As of July 2022, all new U.S. user data is stored automatically in Oracle's U.S. Cloud infrastructure, and access is managed exclusively by the TikTok US Data Security team. USDS is dedicated to making every U.S. user on TikTok feel safe and confident their data is secure and that the platform is free from outside influence. To help ensure that there is no unauthorized access to our systems, such as no "backdoors" or data leakage, Oracle and a third-party source code inspector will work to ensure that everything is performing as intended. NTECH 002028 (TikTok help center article detailing the mode in which US data is stored) The Accused Instrumentalities will access information from the users TikTok profile when determining the content to provide the user.
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	A TikTok profile will have the following details, some unique and others not: • Profile photograph/avatar, with the default option being the first letter of the user's name (e.g. J for John Smith) • Unique username (no spaces) • Display name (not unique, can include spaces) • Following, followers, and likes • Biography The username (enzoknolyt, below) will also be used in the URL of the account. Before April 2020, the smaller name underneath (Enzo Knol) was the user name, but TikTok changed this in the user interface. NTECH 002154 – NTECH 002188 (Detailing the type of user information provided by a user when a TikTok account is created on the TikTok App and the TikTok Website) The Accused Instrumentalities collected large variety of user information, all of which is accessed and utilized by the Accused Instrumentalities in providing media to the user. As depicted by the excerpts below, this user information includes account and profile information, user generated content, messages sent and received by a user within The Accused Instrumentalities, information within a user's personal device, purchase information and more.
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	We may collect information from and about you, including information that you provide, information from other sources, and automatically collected information. Information You Provide When you create an account, upload content, contact us directly, or otherwise use the Platform, you may provide some or all of the following information: • Account and profile information, such as name, age, username, password, language, email, phone number, social media account information, and profile image. • User-generated content, including comments, photographs, livestreams, audio recordings, videos, text, hashtags, and virtual item videos that you choose to create with or upload to the Platform ("User Content") and the associated metadata, such as when, where, and by whom the content was created. Even if you are not a user, information about you may appear in User Content created or published by users on the Platform. When you create User Content, we may upload or import it to the Platform before you save or post the User Content (also known as pre-uploading), for example, in order to recommend audio options, generate captions, and provide other personalized recommendations. If you apply an effect to your User Content, we may collect a version of your User Content that does not include the effect. • Messages, which include information you provide when you compose, send, or receive messages through the Platform's messaging functionalities. They include messages you send through our chat functionality when communicating with merchants who sell goods to you, and your use of virtual assistants when purchasing items through the Platform. That information includes the content of the message and information about the message, such as when it was sent, received, or read, and message participants. Please be aware that messages you choose to send to other users of the Platform will be accessible by those users and that we are not responsible for the manner in which those users use or share the messages. • Information, including text, images, and videos, found in your device's clipboard, with your permission. For example, if you choose to initiate information sharing with a third-party platform, or choose to paste content from the clipboard onto the Platform, we access this information stored in your clipboard in order to fulfill your request. • Purchase information, including payment card numbers or other third-party payment information (such as PayPal) where required for the purpose of payment, and billing and shipping address. We also collect information that is required for extended warranty purposes and your transaction and purchase history on or through the Platform. • Your phone and social network contacts, with your permission. If you choose to find other users through your phone contacts, we will access and collect information such as names, phone numbers, and email addresses, and match that information against existing users of the Platform. If you choose to find other users through your social network contacts, we will collect your public profile information as well as names and profiles of your social network contacts. • Your choices and communication preferences. • Information to verify an account such as proof of identity or age. • Information in correspondence you send to us, including when you contact us for support. • Information you share through surveys or your participation in challenges, research, promotions, marketing campaigns, events, or contests such as your gender, age, likeness, and preferences.
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NTECH 002449 - NTECH 002467 (TikTok’s privacy policy describing the type of user data collected and stored within TikTok’s Servers and databases).

How We Use Your Information

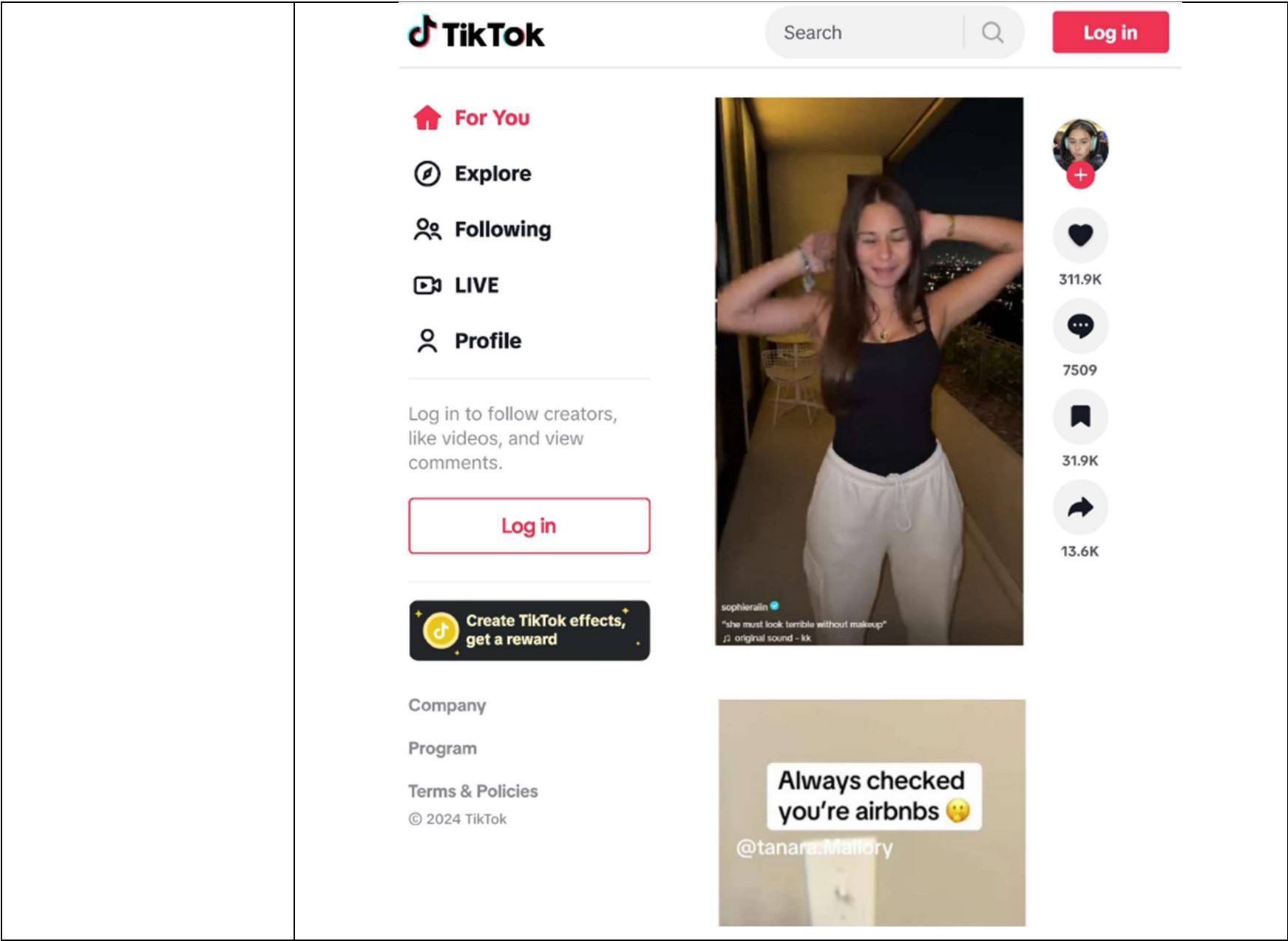
As explained below, we use your information to improve, support and administer the Platform, to allow you to use its functionalities, and to fulfill and enforce our Terms of Service. We may also use your information to, among other things, show you suggestions, promote the Platform, and customize your ad experience.

We generally use the **Information We Collect** → :

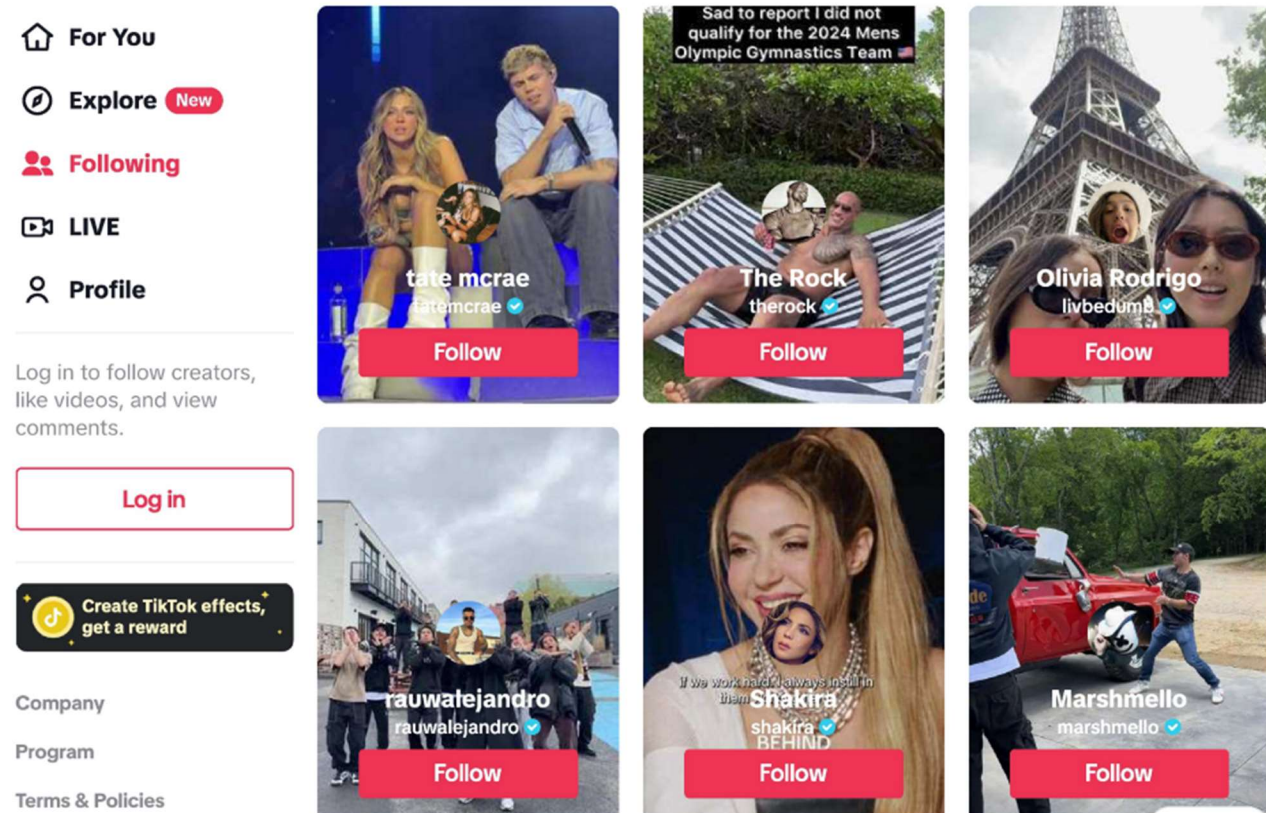
- To fulfill requests for products, services, Platform functionality, support and information for internal operations, including troubleshooting, data analysis, testing, research, statistical, and survey purposes and to solicit your feedback.
- To customize the content you see when you use the Platform. For example, we may provide you with services based on the country settings you have chosen or show you content that is similar to content that you have liked or interacted with.
- To send promotional materials from us or on behalf of our affiliates and trusted third parties.
- To improve and develop our Platform and conduct product development.
- To measure and understand the effectiveness of the advertisements we serve to you and others and to deliver advertising, including targeted advertising, to you on the Platform.
- To make suggestions and provide a customized ad experience.

NTECH 002449 - NTECH 002467 (TikTok help center article stating how the TikTok App and the TikTok Website use user information after user information is accessed by TikTok’s Servers and databases)

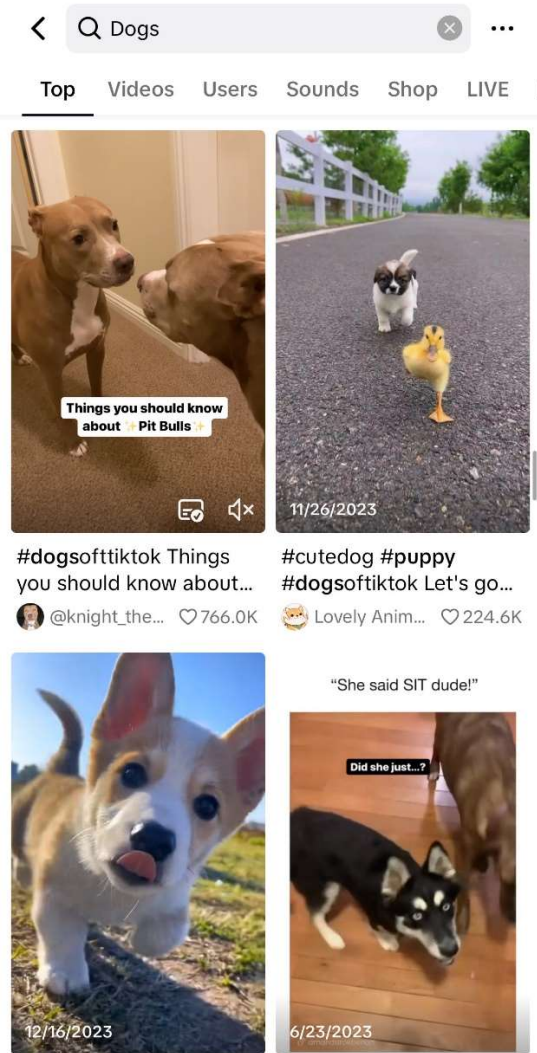
TikTok’s aggregators, including its servers and databases, interpret user selections and activity to collate relevant data or content. As depicted by the excerpts below, TikTok’s media streams made up of content includes at least, content displayed within its “For You” feed, its “Following” feed and the display of content following a search within its search bar, shown below.



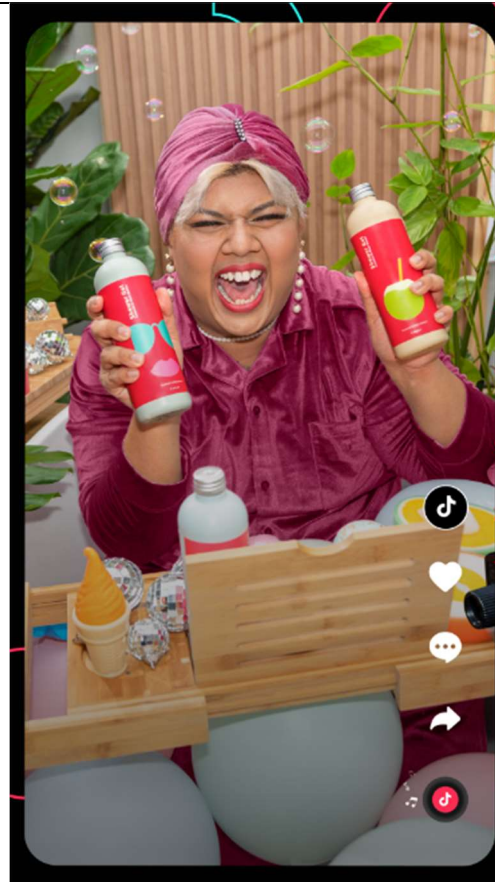
NTECH 002631-NTECH 002632 (Showing media programming generated within the “For You” feed on the TikTok Website and displayed on a computer)



NTECH 002301-NTECH 002306 (Showing TikTok’s “For You” and “Following” feeds, displayed on the TikTok Website)



NTECH 002274 (Showing a search generated by a user within the search bar, displayed on the TikTok App)



	 TikTok for Business Grow your Business with TikTok ads TikTok Ads Manager is the one-stop shop for running and managing paid campaigns on TikTok. TikTok Ads Manager gives you all the features you need to launch effective ads, drive sales and measure performance. Best of all, it's affordable and easy to use. NTECH 002564-2567 (Showing TikTok for Business webpage, showing an advertisement displayed on the TikTok App)
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Video ads

Video ads are available for TikTok itself or for the TikTok family of news apps. They run as 5-60 second full-screen videos in the user's **For You feed**. Each ad includes a video, an ad display image, brand or app name, and ad text.



NTECH – 002097 – 002138 (<https://blog.hootsuite.com/tiktok-advertising/> article showing TikTok advertisement placed into a user's "For You" and "Following" feeds.

1d. based on the user information and the data related to the plurality of media streams, determining by the aggregator a temporal sequence of media programming comprising the media streams	The Accused Instrumentalities use the user information and the stream information when its aggregators, including TikTok's Servers, interpret user information and data associated with content to produce a sequence of relevant content which forms a media stream displayed to a user. The Accused Instrumentalities store and interpret user information along with the available media streams to determine the content to show the user. As depicted by the excerpt below, the Accused Instrumentalities utilize a range of user information including account and profile information, user generated content, messages sent and received by a user within The Accused Instrumentalities, information within a user's personal device, purchase information and more.
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	We may collect information from and about you, including information that you provide, information from other sources, and automatically collected information. Information You Provide When you create an account, upload content, contact us directly, or otherwise use the Platform, you may provide some or all of the following information: • Account and profile information, such as name, age, username, password, language, email, phone number, social media account information, and profile image. • User-generated content, including comments, photographs, livestreams, audio recordings, videos, text, hashtags, and virtual item videos that you choose to create with or upload to the Platform ("User Content") and the associated metadata, such as when, where, and by whom the content was created. Even if you are not a user, information about you may appear in User Content created or published by users on the Platform. When you create User Content, we may upload or import it to the Platform before you save or post the User Content (also known as pre-uploading), for example, in order to recommend audio options, generate captions, and provide other personalized recommendations. If you apply an effect to your User Content, we may collect a version of your User Content that does not include the effect. • Messages, which include information you provide when you compose, send, or receive messages through the Platform's messaging functionalities. They include messages you send through our chat functionality when communicating with merchants who sell goods to you, and your use of virtual assistants when purchasing items through the Platform. That information includes the content of the message and information about the message, such as when it was sent, received, or read, and message participants. Please be aware that messages you choose to send to other users of the Platform will be accessible by those users and that we are not responsible for the manner in which those users use or share the messages. • Information, including text, images, and videos, found in your device's clipboard, with your permission. For example, if you choose to initiate information sharing with a third-party platform, or choose to paste content from the clipboard onto the Platform, we access this information stored in your clipboard in order to fulfill your request. • Purchase information, including payment card numbers or other third-party payment information (such as PayPal) where required for the purpose of payment, and billing and shipping address. We also collect information that is required for extended warranty purposes and your transaction and purchase history on or through the Platform. • Your phone and social network contacts, with your permission. If you choose to find other users through your phone contacts, we will access and collect information such as names, phone numbers, and email addresses, and match that information against existing users of the Platform. If you choose to find other users through your social network contacts, we will collect your public profile information as well as names and profiles of your social network contacts. • Your choices and communication preferences. • Information to verify an account such as proof of identity or age. • Information in correspondence you send to us, including when you contact us for support. • Information you share through surveys or your participation in challenges, research, promotions, marketing campaigns, events, or contests such as your gender, age, likeness, and preferences.
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NTECH 002449 - NTECH 002467 (TikTok privacy policy, detailing the various forms of user information and user data stored within TikTok's Servers and interpreted by software supporting the TikTok App and the TikTok website)

A TikTok profile will have the following details, some unique and others not:

- Profile photograph/avatar, with the default option being the first letter of the user's name (e.g. J for John Smith)
- Unique username (no spaces)
- Display name (not unique, can include spaces)
- Following, followers, and likes
- Biography

The username (enzoknolyt, below) will also be used in the URL of the account. Before April 2020, the smaller name underneath (Enzo Knol) was the user name, but TikTok changed this in the user interface.



enzoknolyt
Enzo Knol

1 Following **699.9K** Followers **2.9M** Likes

No bio yet.

NTECH 002154 – NTECH 002188 (Article detailing the type of user information provide by a user when a TikTok account is created on the TikTok App and the TikTok Website)

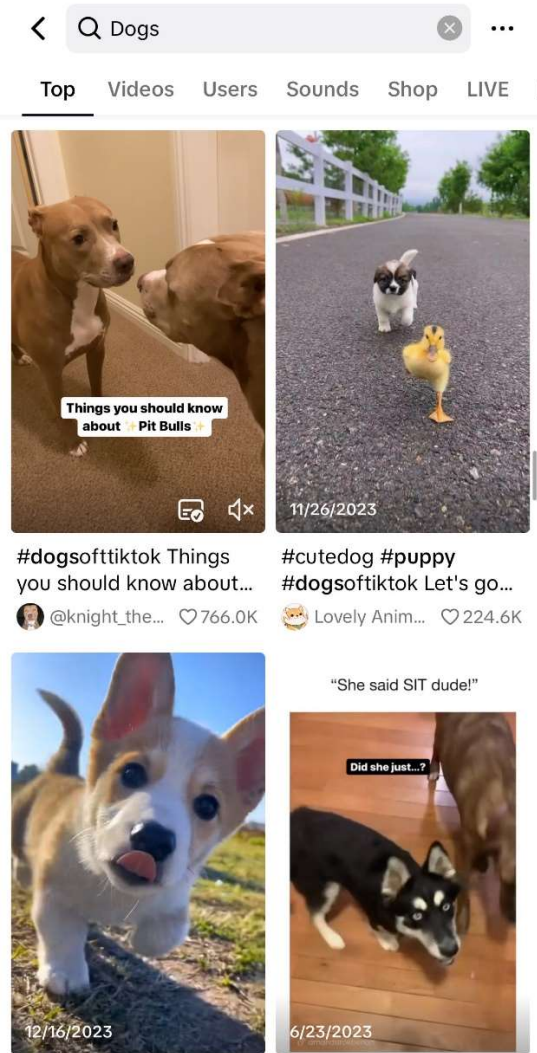
As depicted by the excerpts below, the Accused Instrumentalities use user information for their administration. This user information is used with the available media streams to customize the content that a user sees. This content includes video, audio, music and images, created by individual users and by businesses that advertise on TikTok.

	How We Use Your Information As explained below, we use your information to improve, support and administer the Platform, to allow you to use its functionalities, and to fulfill and enforce our Terms of Service. We may also use your information to, among other things, show you suggestions, promote the Platform, and customize your ad experience. We generally use the Information We Collect → : • To fulfill requests for products, services, Platform functionality, support and information for internal operations, including troubleshooting, data analysis, testing, research, statistical, and survey purposes and to solicit your feedback. • To customize the content you see when you use the Platform. For example, we may provide you with services based on the country settings you have chosen or show you content that is similar to content that you have liked or interacted with. • To send promotional materials from us or on behalf of our affiliates and trusted third parties. • To improve and develop our Platform and conduct product development. • To measure and understand the effectiveness of the advertisements we serve to you and others and to deliver advertising, including targeted advertising, to you on the Platform. • To make suggestions and provide a customized ad experience. NTECH 002449 - NTECH 002467 (TikTok help center article stating how user information is utilized, including to customize content displayed on the TikTok App and the TikTok Website. This customization of content can also be referred to as a temporal sequence of media, known as a media stream) As depicted by the excerpts below, the Accused Instrumentalities are trained using user information.
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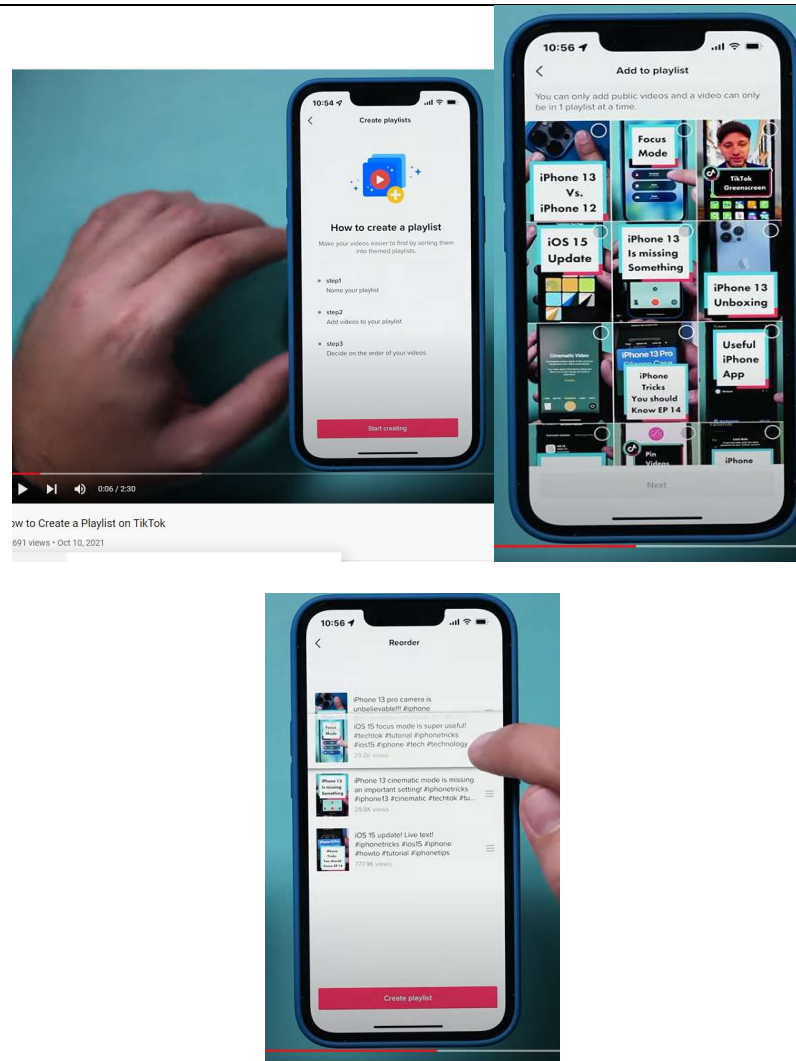
	<i>2.2.1 Streaming Engine.</i> Monolith is built with the capability of seamlessly switching between batch training and online training. This is enabled by our design of streaming engine as illustrated by Figure 4. In our design, we use one Kafka [13] queue to log actions of users (E.g. Click on an item or like an item etc.) and another Kafka queue for features. At the core of the engine is a Flink [4] streaming job for online feature Joiner. The online joiner concatenates features with labels from user actions and produces training examples, which are then written to a Kafka queue. The queue for training examples is consumed by both online training and batch training: NTECH 002264 - NTECH 00227 (Research paper by ByteDance Inc. detailing how data associated with a user, including user information, and data associated with content (also known as features) is joined to produce a media stream for display on the TikTok App or the TikTok website) As depicted by the excerpts below, TikTok’s Servers and TikTok’s supporting software interpret data associated with content on its platform including at least, the location of content, the length of content, the subject matter of content, the caption, sounds, hashtags, number of views and more.
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	Why a video is recommended on your For You feed At TikTok, we want to help you understand why certain videos appear on your For You feed. That's why we share this information on each video in the feed. To learn why a video is recommended to you: 1. In the TikTok app, tap the Share button on the side of a video in the For You feed. 2. Tap Why this video. We'll list some reasons why a video shows up on your feed, such as: ◦ You commented on, liked, shared, or watched similar videos ◦ This video is popular in your country ◦ This video was posted recently ◦ This video is longer, and you seem to like longer videos ◦ You're following this creator Keep in mind, if you've recently refreshed your For You feed, you'll see a variety of videos while we learn your preferences to launch your new personalized feed. NTECH 002226 - NTECH 002231 (TikTok's help center describing various forms of data related to content, processed by TikTok's servers and supporting software resulting in media programming recommend for a user in a media stream, known as TikTok's "For You" feed)
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	For You Factors that may influence your For You feed include: • User interactions: Videos you like, share, or comment on, videos you watch in full or skip, accounts you follow, and accounts that follow you. • Video information: Captions, sounds, hashtags, number of video views, and the country the video was published. • User information: Device and account settings, language preference, country, time zone and day, and device type. We consider all these factors to predict how relevant and interesting content might be to a viewer. Different factors can play a larger or smaller role in what's recommended, and the importance—or weighting—of a factor can change over time. For instance, the time spent watching a specific video is generally weighted more heavily than other factors. However, if a viewer never finishes watching any videos, but watches a lot of videos posted by creators in the same region, then that region may have a relatively stronger weight compared to other factors for that viewer. Factors like device settings generally receive lower weight compared to other factors. NTECH 002226 - NTECH 002231 (TikTok’s help center describing various forms of data related to content and user data, processed by TikTok’s servers and supporting software resulting in media programming recommend for a user in a media stream, known as TikTok’s “For You” feed) As depicted by the excerpts below, aggregators including TikTok’s Servers and software supporting the TikTok App and the TikTok Website, connect user action and data, with data associated with content. For example, TikTok Servers receive instruction from a user indicating the user’s selection of one of the media streams presented on the TikTok App or/and the TikTok Website by the front-end servers. This occurs in the form of a search in TikTok’s search bar, the creation of a playlist, selecting a hashtag, and more.
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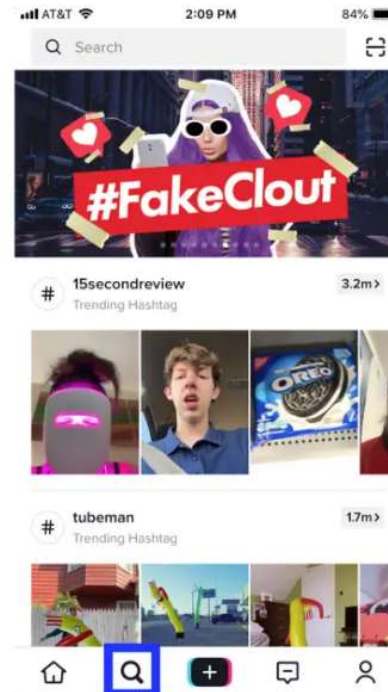
NTECH 002274 (showing a search generated by a user within the search bar connecting user action with corresponding data associated with content, displayed on the TikTok App)



NTECH 002007 - NTECH 002007 (See <https://www.youtube.com/watch?v=StNbxwqnKmc> at 2:30 showing a user curating a playlist on the TikTok App by sending instructions indicating selections of a media stream)

	How to search on TikTok To search users, videos, sounds, LIVEs, and hashtags: 1. Tap the search icon in the top right of your screen. 2. Enter what you're looking for in the search bar and tap Search. Be as specific as possible. For example, you can type the name of the content or the username of a creator. 3. The most relevant results will show in the Top tab. 4. Explore the other search tabs—Users, Videos, Sounds, LIVE, and Hashtags—for related content. Note: The hashtag page displays the videos that started the trend first, and then other popular videos relevant to the trending hashtag. NTECH 002381 – NTECH 002386 (TikTok help center directing users on how to send instructions to TikTok’s servers through the TikTok App and/or the TikTok Website by performing a search including searching a hashtag. Also providing examples of data related to content that enables TikTok’s servers to generate the appropriate resulting media stream)
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The second tab in the menu running across the bottom of TikTok, represented by a magnifying glass, is where you'll find what's trending on the app. This is TikTok's bread and butter: it's where the latest viral trends are found, and associated hashtags are tracked.



TikTok/Business Insider

NTECH 002202 - NTECH 002225 (Article explaining the function of TikTok's search bar)

As another example, aggregators including TikTok's Servers, connect user data and previous user action to generate and recommend content also known as features.

As depicted by the excerpts below, the Accused Technologies predict content for a user by interpreting user interaction, video information and user information. This results in a media stream like the “For You” feed.

For You

Factors that may influence your For You feed include:

- **User interactions:** Videos you like, share, or comment on, videos you watch in full or skip, accounts you follow, and accounts that follow you.
- **Video information:** Captions, sounds, hashtags, number of video views, and the country the video was published.
- **User information:** Device and account settings, language preference, country, time zone and day, and device type.

We consider all these factors to predict how relevant and interesting content might be to a viewer. Different factors can play a larger or smaller role in what's recommended, and the importance—or weighting—of a factor can change over time. For instance, the time spent watching a specific video is generally weighted more heavily than other factors. However, if a viewer never finishes watching any videos, but watches a lot of videos posted by creators in the same region, then that region may have a relatively stronger weight compared to other factors for that viewer. Factors like device settings generally receive lower weight compared to other factors.

NTECH 002226 - NTECH 002231 (Describing how the TikTok App and the TikTok Website generate a media stream by connecting user data, including user action and user information, with data related to content)

	2.2.2 <i>Online Joiner.</i> In real-world applications, user actions log and features are streamed into the online joiner (Figure 5) without guarantee in time order. Therefore we use a unique key for each request so that user action and features could correctly pair up. The lag of user action could also be a problem. For example, a user may take a few days before they decide to buy an item they were presented days ago. This is a challenge for the joiner because if all features are kept in cache, it would simply not fit in memory. In our system, an on-disk key-value storage is utilized to store features that are waiting for over certain time period. When a user action log arrives, it first looks up the in-memory cache, and then looks up the key-value storage in case of a missing cache. NTECH 002264 - NTECH 00227 (A research paper by Bytedance Inc. detailing Monolith, a recommendation system used by TikTok which connects user action data with data associated with content or features, in real time, known as an online joiner)
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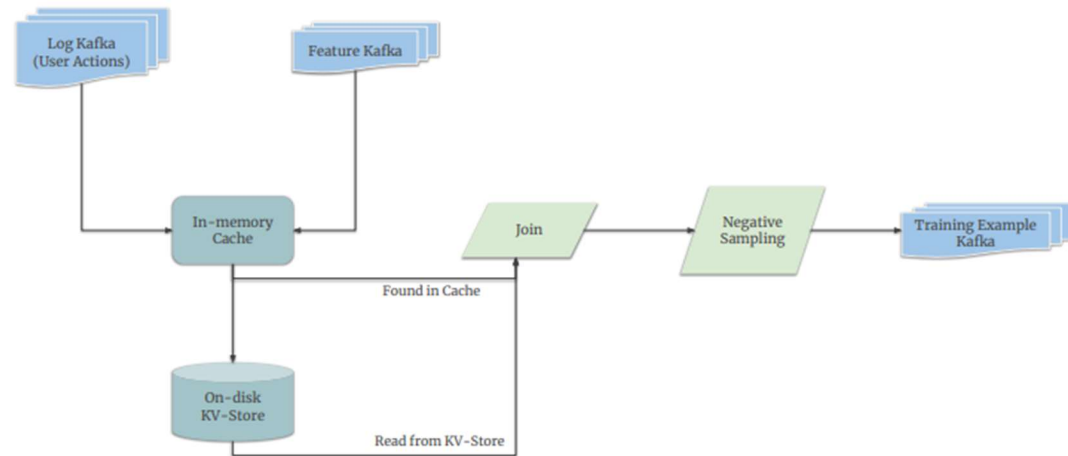


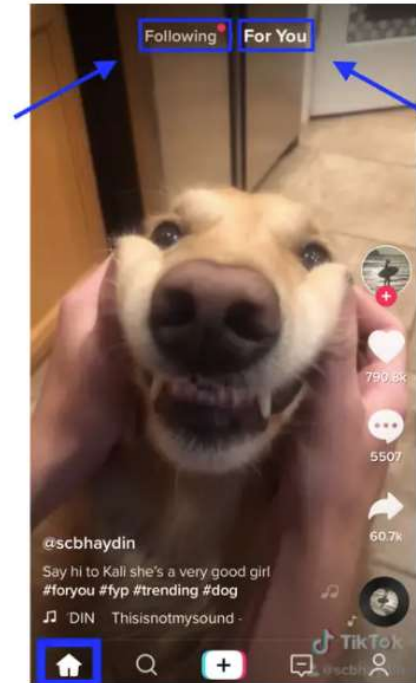
Figure 5: Online Joiner.

NTECH 002264 - NTECH 00227 (A research paper by Bytedance Inc. detailing Monolith, a recommendation system used by TikTok which connects user action data with data associated with content or features, in real time, known as an online joiner)

TikTok's Servers and software supporting the TikTok App and the TikTok Website produce a sequence of media programming to create a media stream displayed on the TikTok App and the TikTok Website.

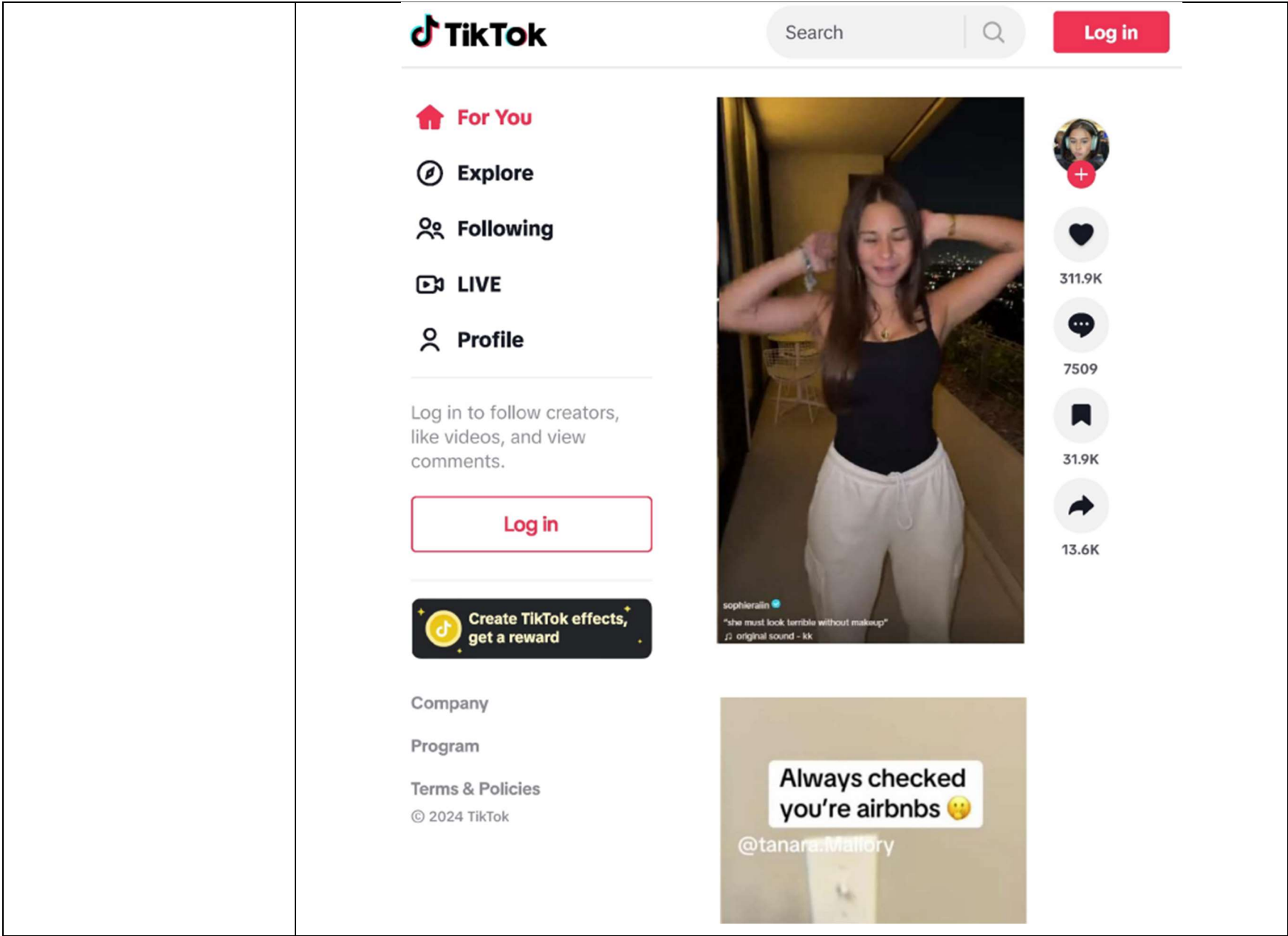
As depicted by the excerpts below, TikTok's media stream is made up of content which includes at least, content displayed within its "For You" feed, its "Following" feed and the display of content following a search within its search bar.

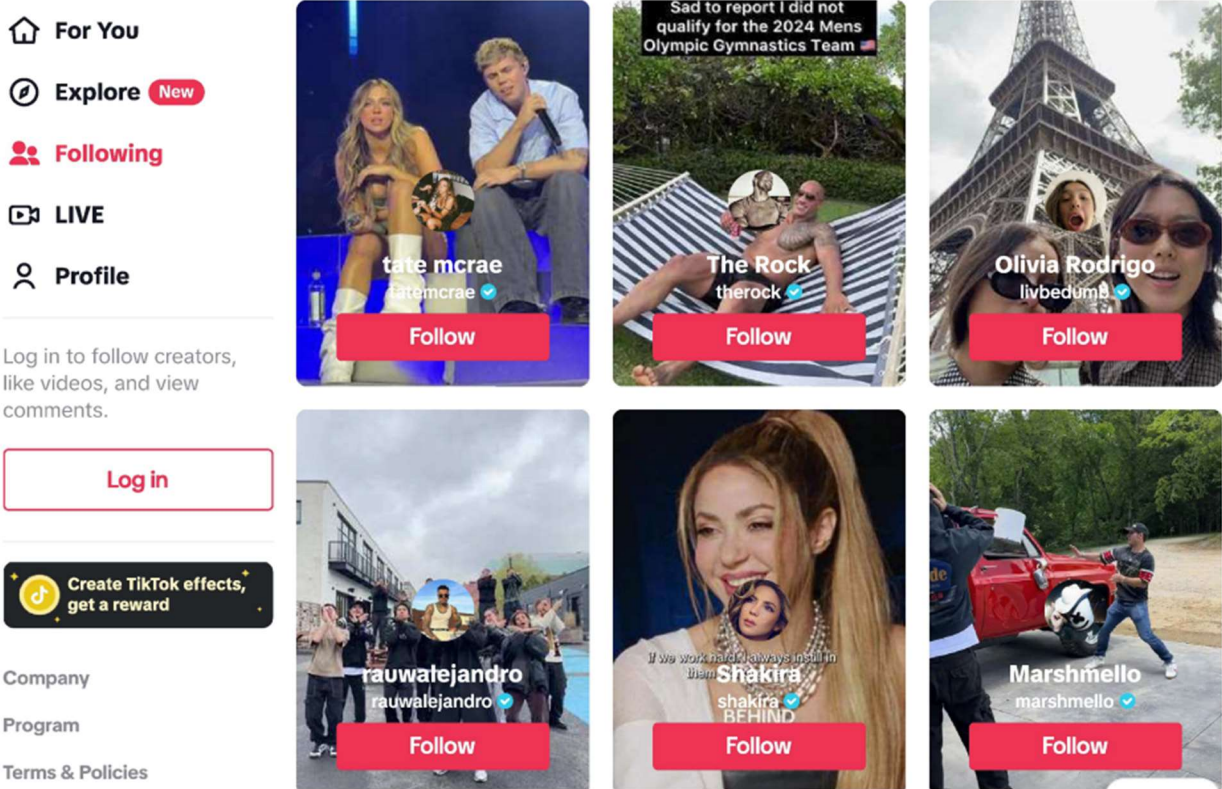
The TikTok home page, where your feed lives, is split up into two sections: "following," to only see content from users you follow, and "for you," which amasses popular content from across TikTok, similar to Instagram's Explore page.



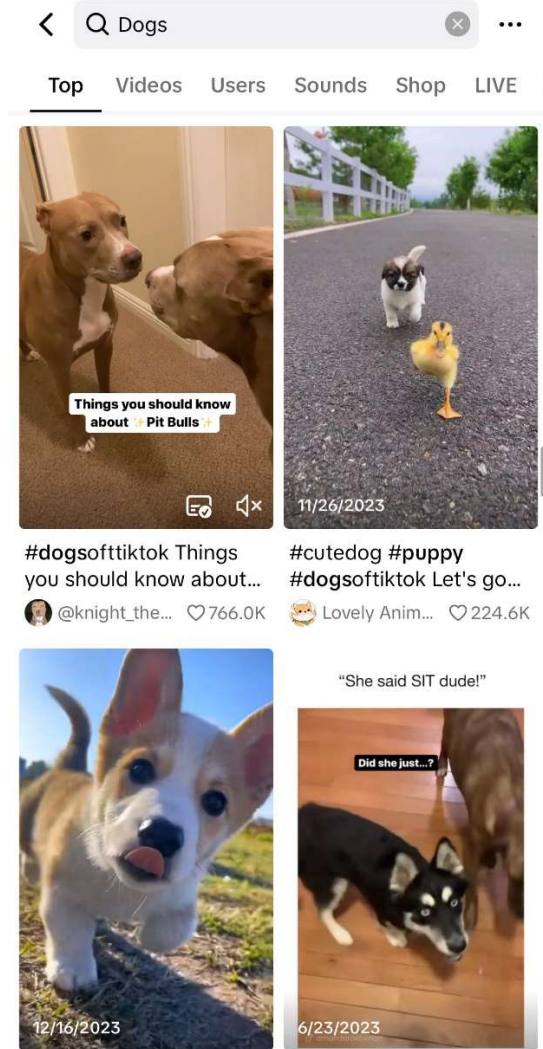
TikTok/Business Insider

NTECH 002205, 2207 (Showing TikTok's "For You" and "Following" feeds within the TikTok App)



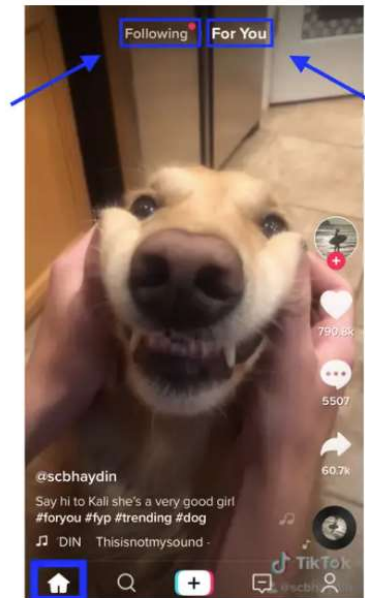
	NTECH 002631-NTECH 002632 (Showing TikTok’s “For You” feed, displayed on the TikTok Website)  NTECH 002301-NTECH 002306 (showing TikTok’s “Following” feeds, displayed on the TikTok Website)
1e. accessing by the aggregator over a network the plurality of media streams; and	The Accused Instrumentalities access user data and data associated with content, in the Cloud through its internal network or the internet, in order to complete the processes of creating the “For You” feed,

	“Following” feed and search results. The Accused Instrumentalities store numerous different media streams that can be presented to the user based on their preferences. TikTok Servers receive instructions from a user’s device connected to the internet, indicating the user’s selection of content or search for content. This user action produces a media stream presented on the TikTok App and/or the TikTok Website by the front-end servers, and displayed on a client such as a mobile phone or a computer. As depicted by the excerpts below, TikTok stores user data in the Cloud including TikTok’s cloud infrastructure , AWS, Google Cloud, Oracle’s U.S. Cloud infrastructure or other cloud infrastructure, requiring an internet connection and therefore a network, to retrieve user data and produce a plurality of media streams including a search stream, the “For You” and “Following” feeds, the exploration of a hashtag, the creation of a playlist and more Data Storage for U.S. Users As of July 2022, all new U.S. user data is stored automatically in Oracle's U.S. Cloud infrastructure, and access is managed exclusively by the TikTok US Data Security team. USDS is dedicated to making every U.S. user on TikTok feel safe and confident their data is secure and that the platform is free from outside influence. To help ensure that there is no unauthorized access to our systems, such as no "backdoors" or data leakage, Oracle and a third-party source code inspector will work to ensure that everything is performing as intended. NTECH 002028 (TikTok USDS article, detailing TikTok’s storage of data pertaining to US users in the Cloud)
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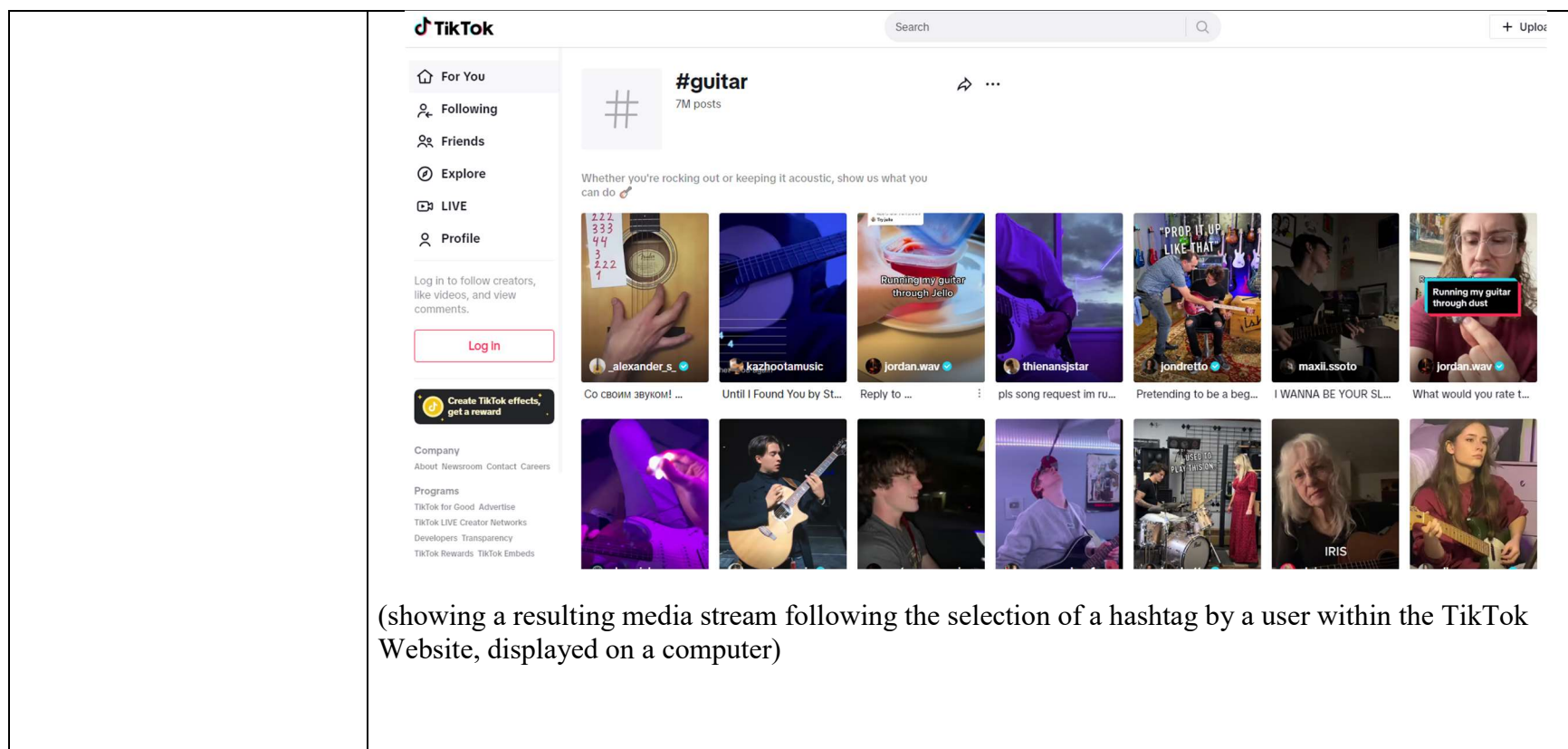
NTECH 002274 (Showing a search generated by a user within the search bar within the TikTok App, displayed on a mobile phone)

The TikTok home page, where your feed lives, is split up into two sections: "following," to only see content from users you follow, and "for you," which amasses popular content from across TikTok, similar to Instagram's Explore page.

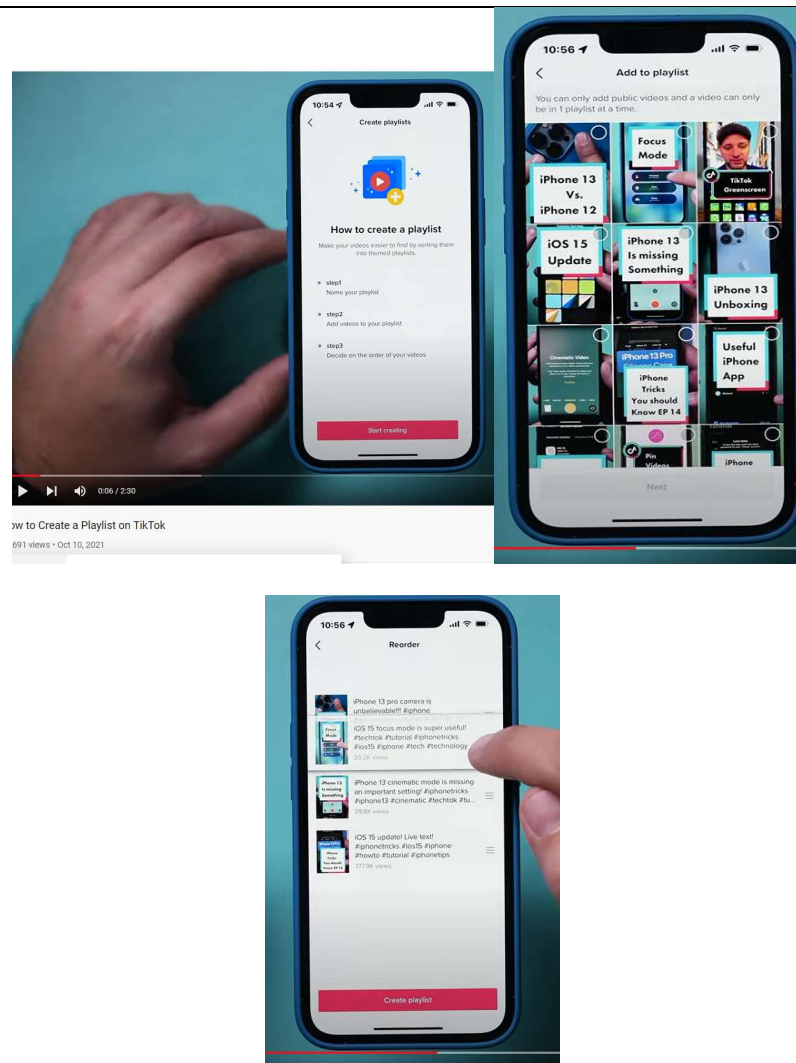


TikTok/Business Insider

NTECH 002205, 2207 (Showing TikTok's "For You" and "Following" feeds within the TikTok App)



(showing a resulting media stream following the selection of a hashtag by a user within the TikTok Website, displayed on a computer)



NTECH 002007 - NTECH 002007 (See <https://www.youtube.com/watch?v=StNbxwqnKmc> at 2:30 showing a user curating a playlist within the TikTok App by sending instructions indicating selections of a content, resulting in a media stream)

1f. providing by the aggregator to the client media programming in the determined temporal sequence, the media programming comprising concatenated elements of the plurality of media streams.	The Accused Instrumentalities interpret user actions to create a unique media stream (also known as a feed) made up of elements (also known as content), to create the “For You” feed, “Following” feed, the result of a search and the exploration of a hashtag. These media streams consist of a predetermined sequence of content, which are connected by common themes including user data, user action, demographic recommendations and more. The content displayed in the feed is concatenated because each piece of content is linked to the other as a user scrolls through a feed. In some cases, content is also linked together by subject matter, as is the case when a search stream, a playlist or hashtag stream is generated. As shown below, the Accused Instrumentalities will determine media programming to present to the user and will present a unique media stream in their “For You” feed and “Following” feed. The Accused Instrumentalities use user data to determine each individual piece of content, including advertisement, that will be recommended to a user, as shown below. Why a video is recommended on your For You feed At TikTok, we want to help you understand why certain videos appear on your For You feed. That's why we share this information on each video in the feed. To learn why a video is recommended to you: 1. In the TikTok app, tap the Share button on the side of a video in the For You feed. 2. Tap Why this video. We'll list some reasons why a video shows up on your feed, such as: ◦ You commented on, liked, shared, or watched similar videos ◦ This video is popular in your country ◦ This video was posted recently ◦ This video is longer, and you seem to like longer videos ◦ You're following this creator Keep in mind, if you've recently refreshed your For You feed, you'll see a variety of videos while we learn your preferences to launch your new personalized feed.
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NTECH 002226 - NTECH 002231 (Showing how TikTok interprets user action to recommend content)

How We Use Your Information

As explained below, we use your information to improve, support and administer the Platform, to allow you to use its functionalities, and to fulfill and enforce our Terms of Service. We may also use your information to, among other things, show you suggestions, promote the Platform, and customize your ad experience.

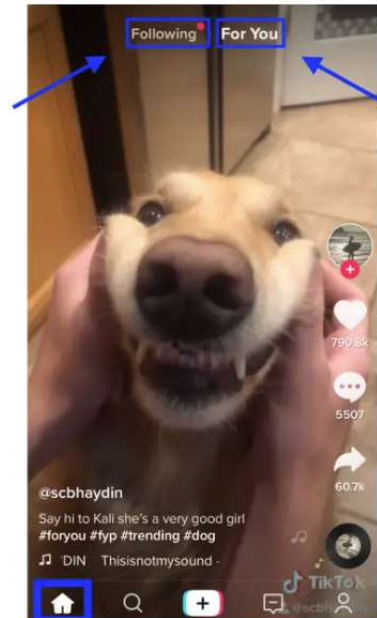
We generally use the **Information We Collect** → :

- To fulfill requests for products, services, Platform functionality, support and information for internal operations, including troubleshooting, data analysis, testing, research, statistical, and survey purposes and to solicit your feedback.
- To customize the content you see when you use the Platform. For example, we may provide you with services based on the country settings you have chosen or show you content that is similar to content that you have liked or interacted with.
- To send promotional materials from us or on behalf of our affiliates and trusted third parties.
- To improve and develop our Platform and conduct product development.
- To measure and understand the effectiveness of the advertisements we serve to you and others and to deliver advertising, including targeted advertising, to you on the Platform.
- To make suggestions and provide a customized ad experience.

NTECH 002449 - NTECH 002467 (TikTok help center article stating how user information is utilized, including to customize content displayed on the TikTok App and the TikTok Website)

As depicted by the excerpt below, the Accused Instrumentalities will generate two media streams, the “For You” and “Following” feeds. Each concatenated to display media programming or content, connected to each other to produce a chain of media programming.

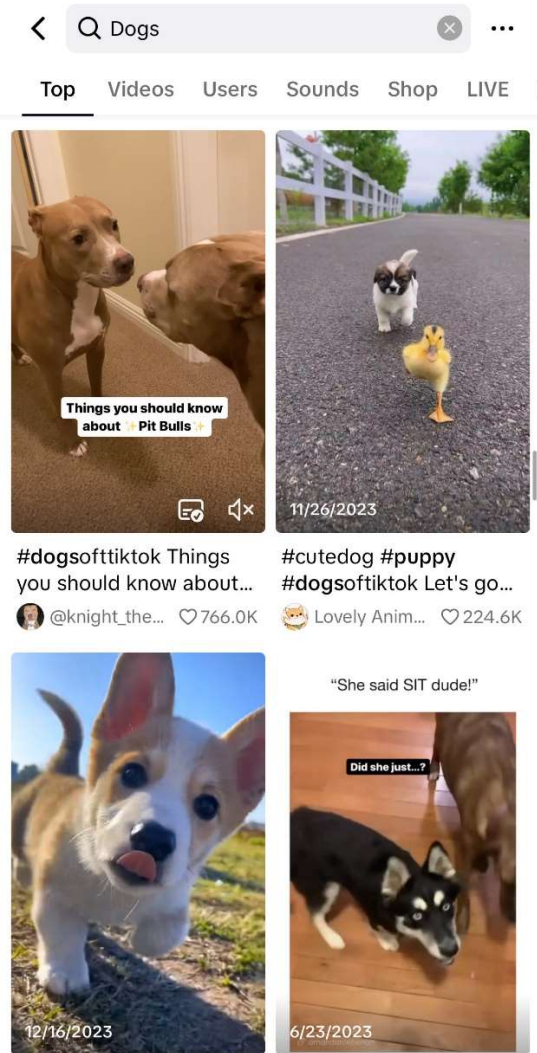
The TikTok home page, where your feed lives, is split up into two sections: "following," to only see content from users you follow, and "for you," which amasses popular content from across TikTok, similar to Instagram's Explore page.



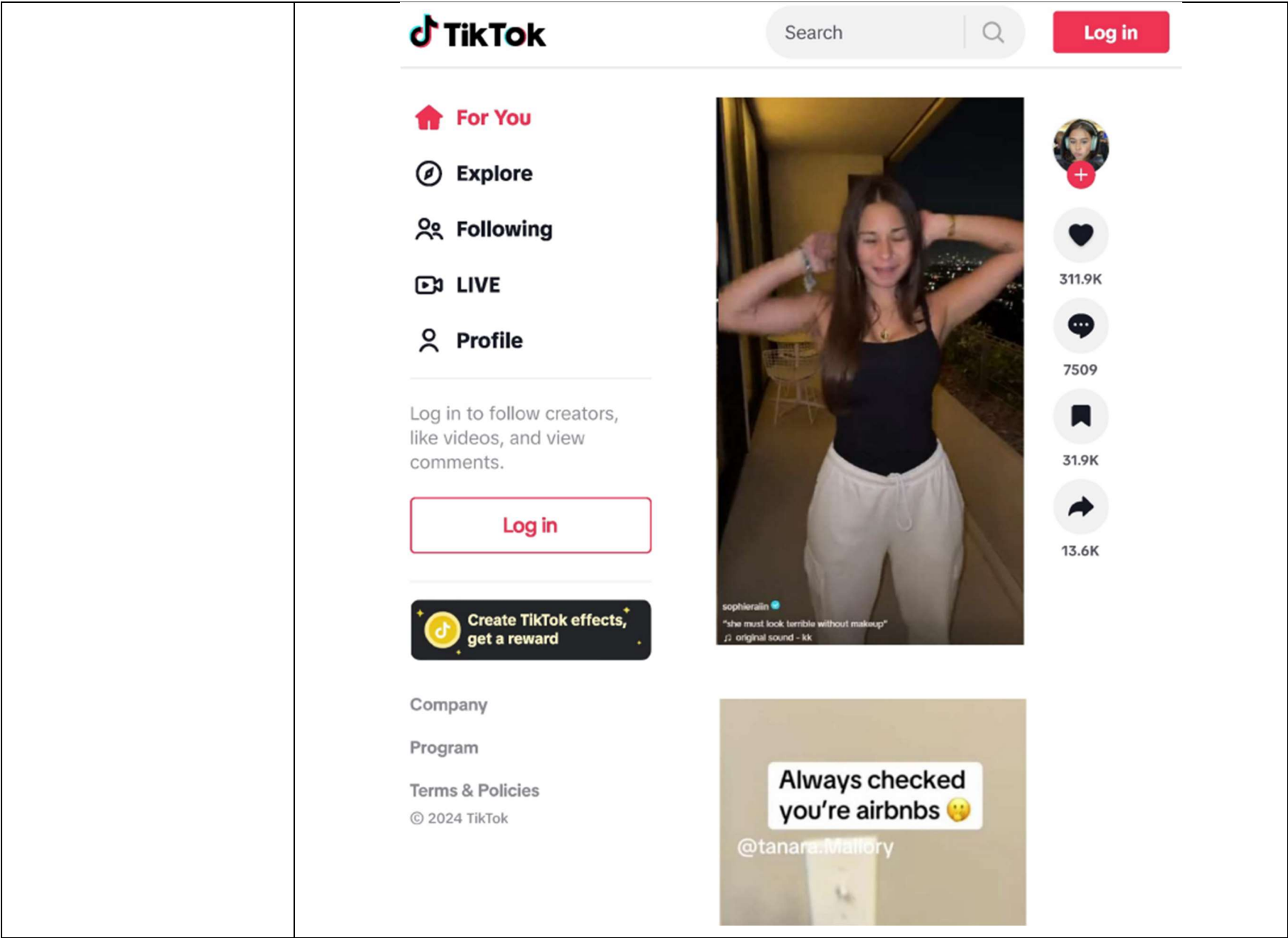
TikTok/Business Insider

NTECH 002205, 2207 (showing TikTok's "For You" feed and "Following" feed composed of a predetermined sequence of content, displayed on the TikTok App on a mobile phone)

As depicted by the excerpts below, the Accused Instrumentalities will take different videos and concatenate them together into a media feed, in a predetermined sequence of content.



NTECH 002274 (showing the results of a search, consisting of a predetermined and concatenated sequence of content, displayed on the TikTok App on a mobile phone)



NTECH 002631-NTECH 002632 (Showing TikTok’s “For You” feed composed of a predetermined and concatenated sequence of content, within the TikTok Website, displayed on a computer)

-  **For You**
-  **Explore** New
-  **Following**
-  **LIVE**
-  **Profile**

Log in to follow creators,
like videos, and view
comments.

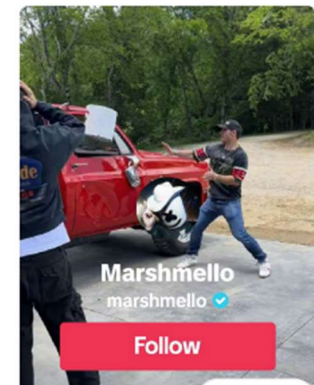
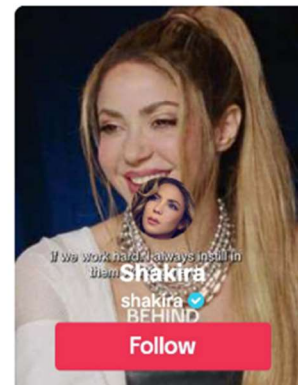
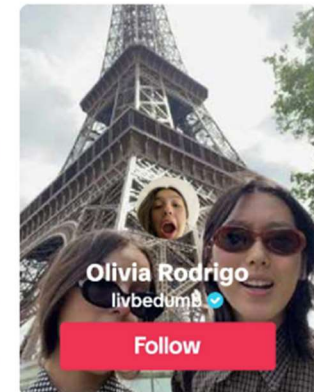
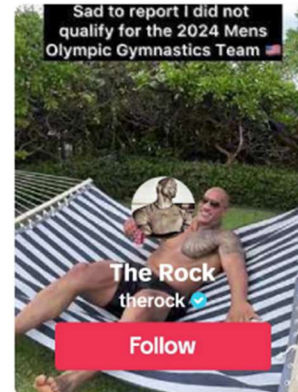
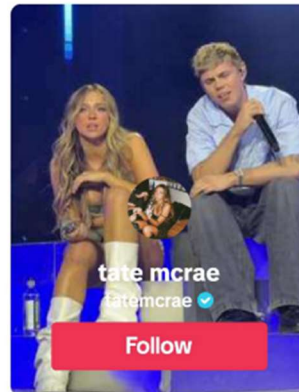
[Log in](#)

 Create TikTok effects,
get a reward

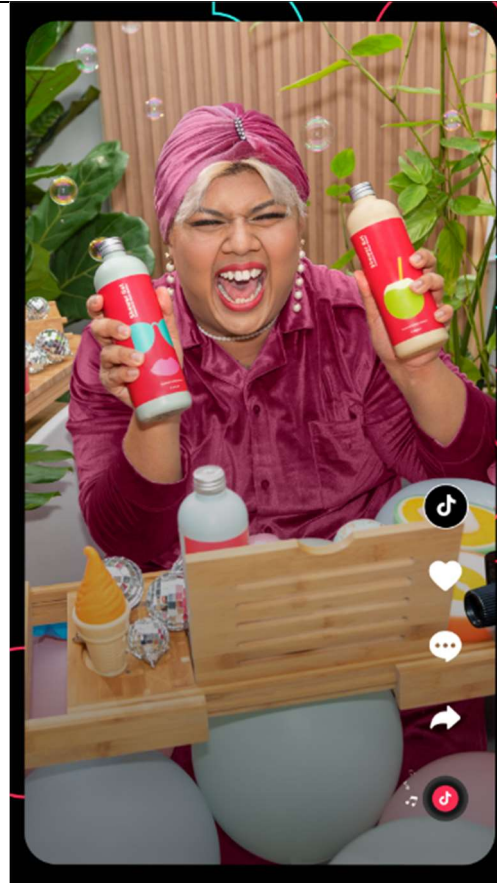
Company

Program

Terms & Policies



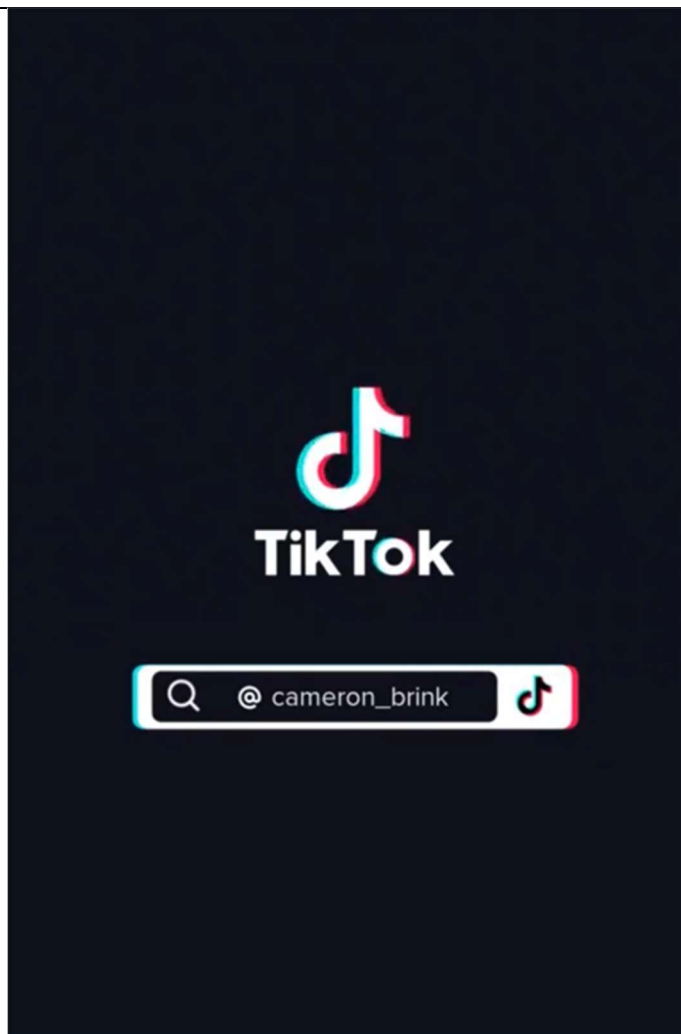
NTECH 002301-NTECH 002306 (Showing TikTok’s “Following” feed composed of a predetermined and concatenated sequence of content, within the TikTok Website, displayed on a computer)



NTECH 002564-2567 (Showing TikTok for Business webpage, showing an advertisement displayed on the TikTok App)

Further, the TikTok logo and sound is concatenated into the end of video clips, as depicted below.



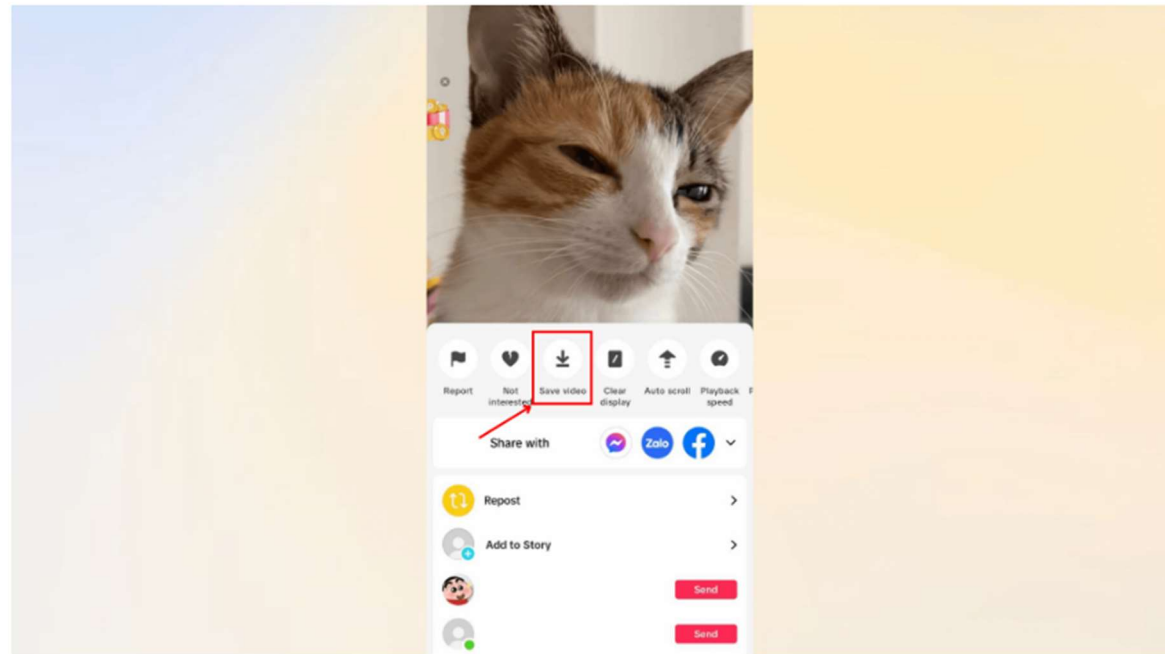


NTECH 002669 and NTECH 002667 (Showing the TikTok logo and sounds concatenated at the end of a video clip)

Further the Accused Instrumentalities concatenate two or more video clips in a process called a “Stitch”. A “Stitch” is a TikTok creative feature that allows videos from various TikTok creators to be

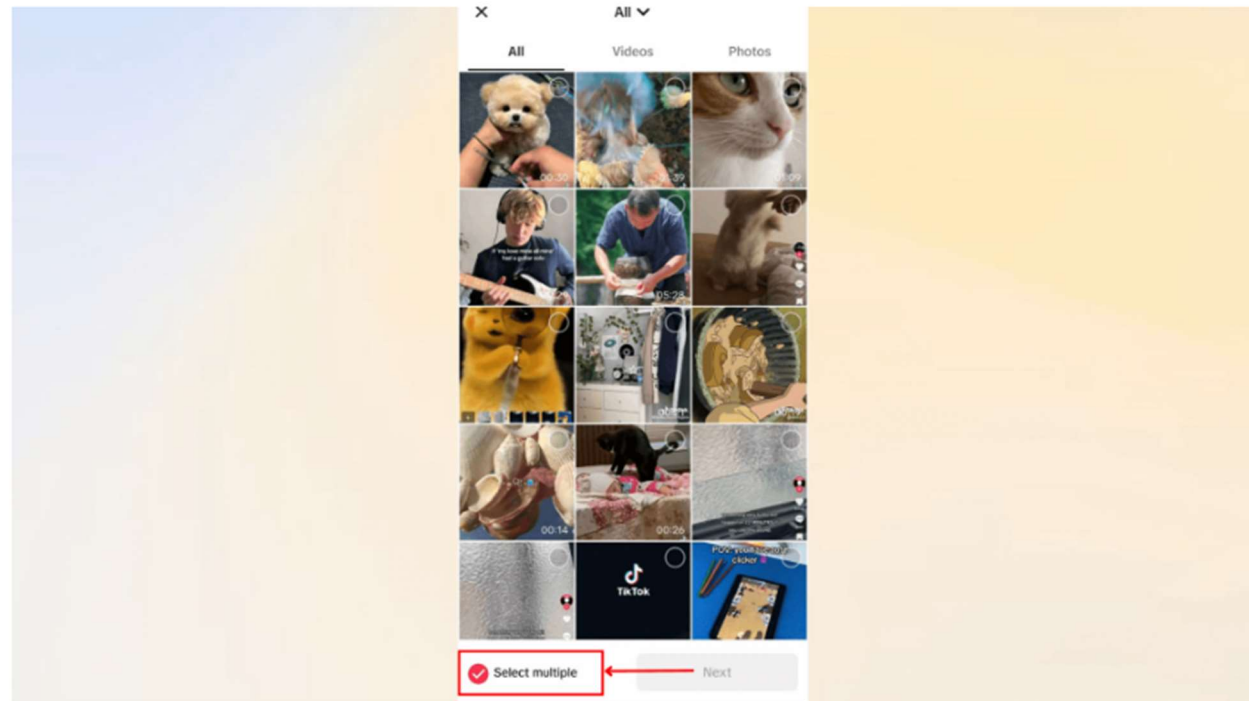
concatenated into other video clips, by editing and trimming parts of these video clip. A first trimmed video clip is edited to incorporate a second video clip at the end, to form one new and concatenated video clip, as depicted below.

Step 1. Download the TikTok video you want to stitch.



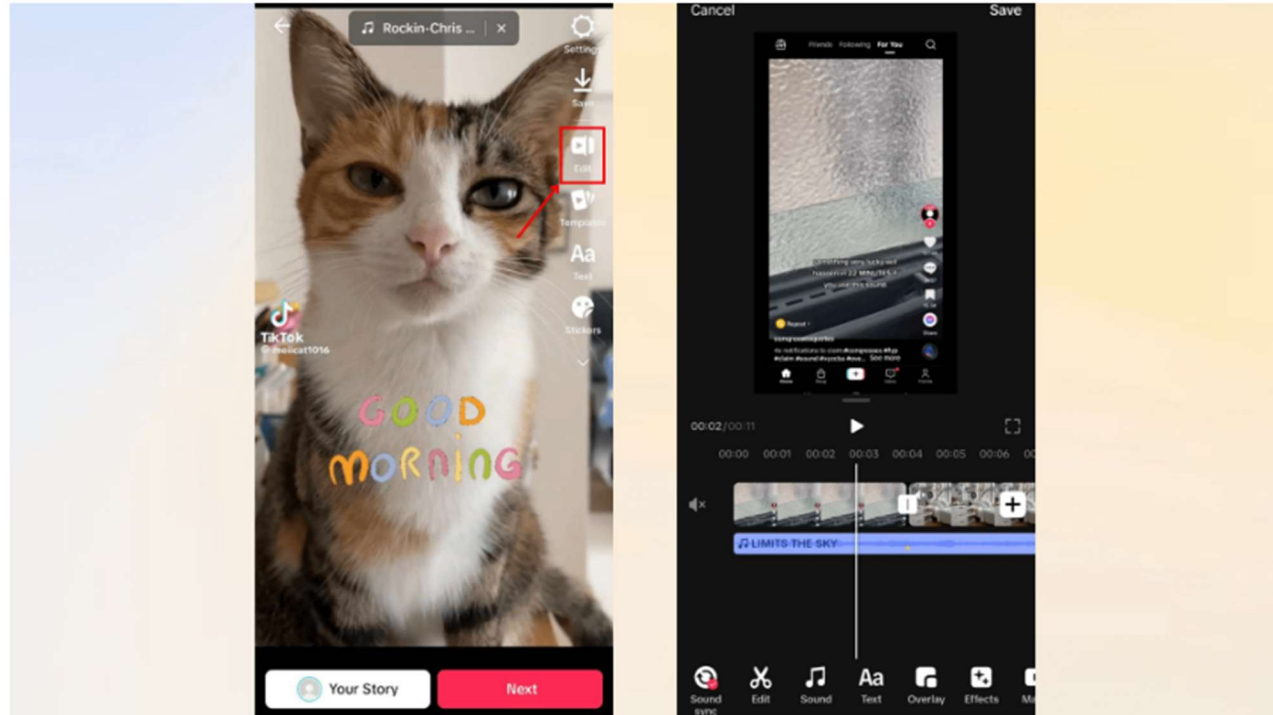
NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

Step 2. Open the TikTok app and hit the (+) button to create a new video. Tick Select multiple then choose the video you'd like to Stitch and the video you want to incorporate with it.



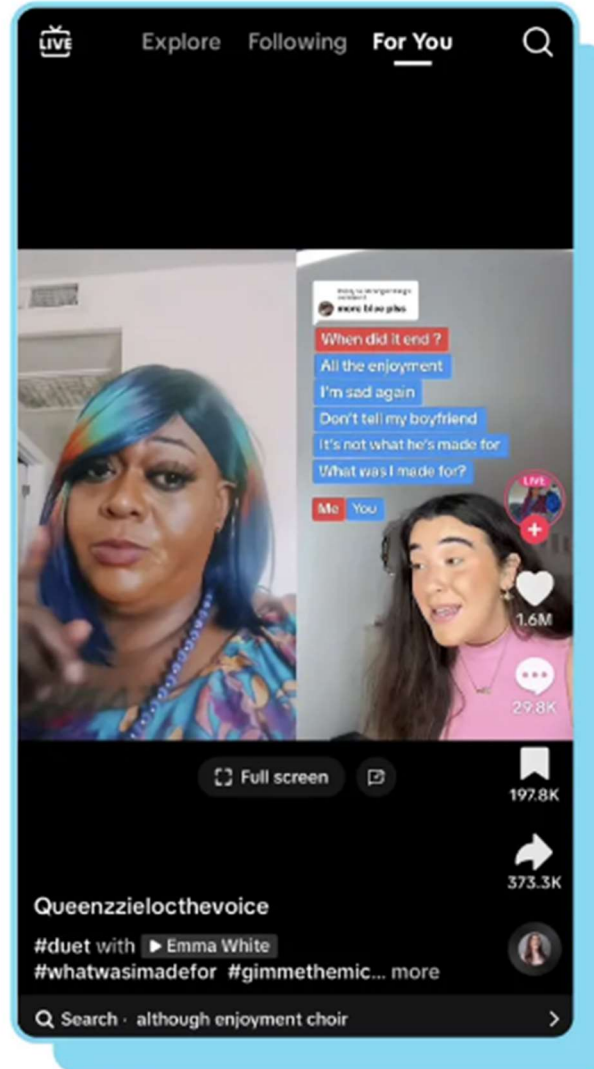
NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

Step 3. Click Edit from the right menu bar and trim the video you want to stitch video to 5s. When you are done editing, tap Save then Next to upload your video. Tag the creator of the initial video.



NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

Further the Accused Instrumentalities concatenate two or more video clips in a process called a “Duet”. A “Duet” is a TikTok creative feature that allows videos from various TikTok creators to be concatenated into other video clips, by editing parts of these video clip. A first video clip is edited to incorporate a second video clip beside the first video clip. This forms one new and concatenated video clip, in which both video clips are displayed side by side, as depicted below.



NTECH 002652 – NTECH 002666 (Showing concatenated TikTok video by a TikTok “Duet”)

	To the extent that TikTok argues that the claim element is not met literally, the Accused Instrumentalities also infringe under the doctrine of equivalents. The Accused Instrumentalities perform the element in substantially the same functionality of providing a client media programming comprising a temporal sequence with concatenated elements from a plurality of media streams by linking and/or merging clips in the feed display (as shown in the “For You” feed), advertisements, Stitch functionality, Duets functionality, or with adding the TikTok logo and sound clip. The Accused Instrumentalities perform the element in substantially the same way because TikTok servers will link or merge clips in a temporal fashion by selecting which clips proceeds will proceed in time. The Accused Instrumentalities achieve the same result by linking or merging the clips.
'704 Patent Claim 2	
2. The method of claim 1, wherein the aggregator comprises a web server.	See claim1. Further, aggregators belonging to the Accused Instrumentalities comprise web servers which receive user requests and in turn generate web pages for display on a client device. As depicted below, the cloud server software used by the Accused Instrumentalities include TikTok’s cloud infrastructure, Google Cloud Platform, AWS, Alibaba Cloud, Data Camo, Microsoft Azure, Oracle cloud, and/or other cloud infrastructure, are its web servers. Data Storage for U.S. Users As of July 2022, all new U.S. user data is stored automatically in Oracle's U.S. Cloud infrastructure, and access is managed exclusively by the TikTok US Data Security team. USDS is dedicated to making every U.S. user on TikTok feel safe and confident their data is secure and that the platform is free from outside influence. To help ensure that there is no unauthorized access to our systems, such as no "backdoors" or data leakage, Oracle and a third-party source code inspector will work to ensure that everything is performing as intended. NTECH 002028 (Stating TikTok’s use of Cloud servers to store data)

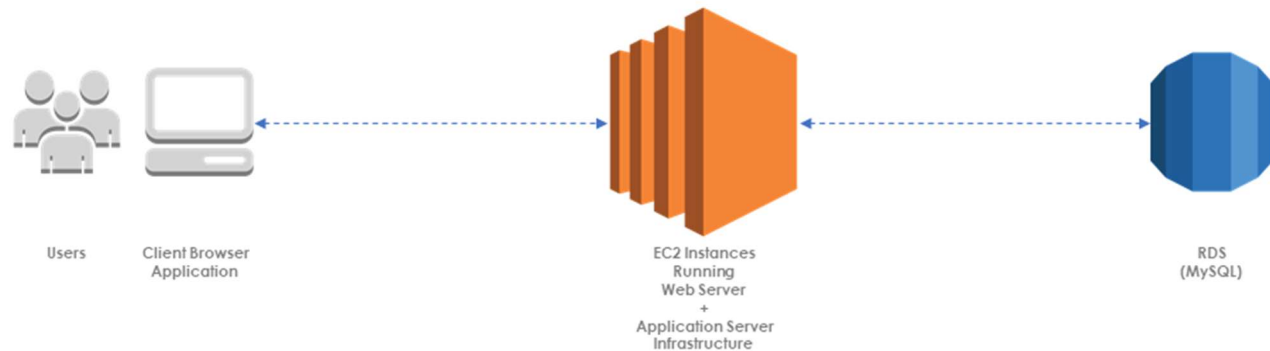
HOSTING

Cloud hosting vendors like AWS and Microsoft Azure provide cloud-based computing and network resources to deliver applications. The hosting platforms used by **TikTok** are summarized below by geographical points-of-presence (PoP). Each PoP can host many IPs to deliver an application.

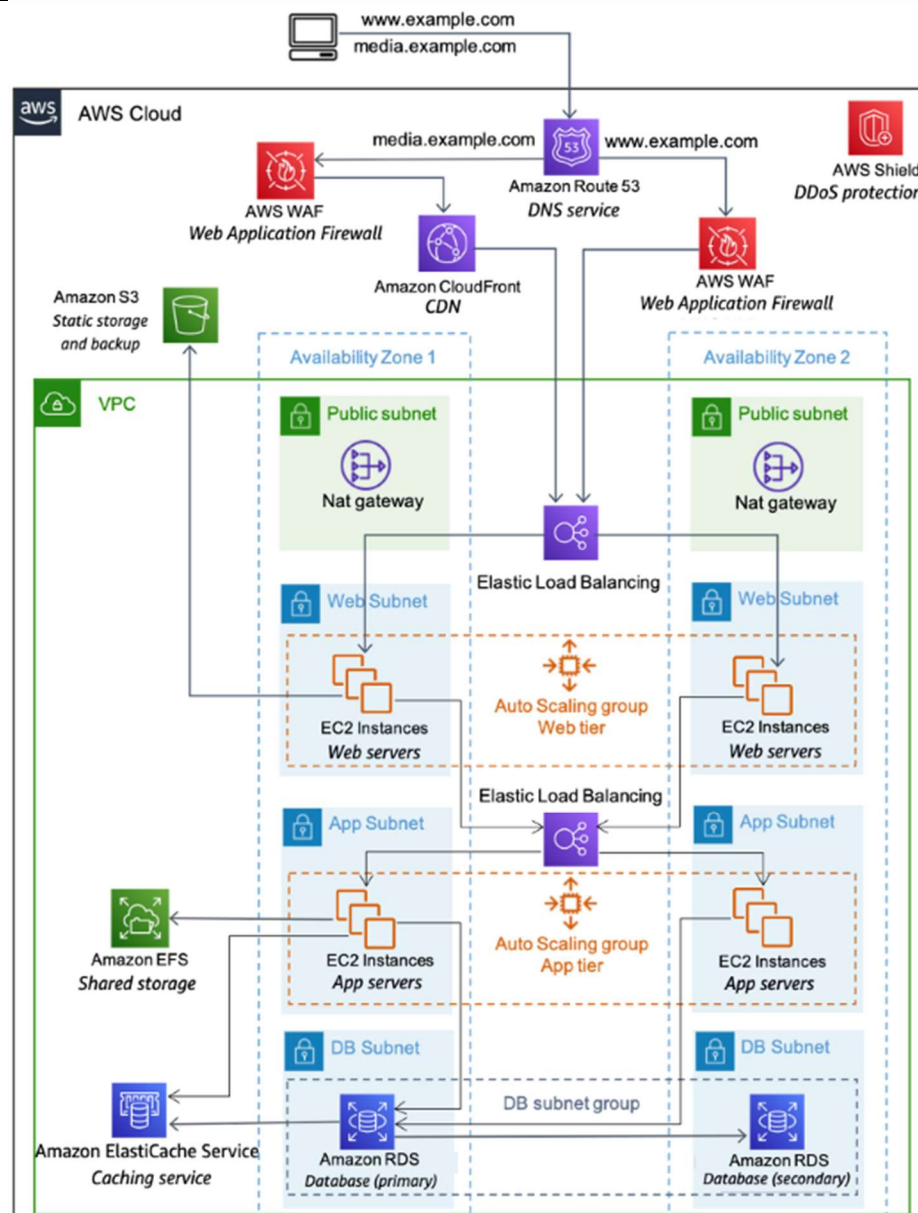
Cloud Hosts	# of IPs
 Google Cloud Platform	17
 Oracle Cloud	44
 DataCamp	235
 Volcengine	83
 Kaopu Cloud	7
 Microsoft Azure	1
 Zenlayer	25
 Alibaba Cloud	19
 Amazon AWS	3

NTECH 002528 – NTECH 00255 (Article listing the cloud webserver platform used by the Accused Instrumentalities)

The aggregator of the Accused Instrumentalities comprises TikTok's cloud-based web servers for delivering web pages on a client. Various servers i.e app servers, web servers, data servers and more are comprised within the aggregator of the Accused Instrumentalities, as depicted below.



	NTECH 002232 – NTECH 002241(Graphic depicting the use of a web server in a client server architecture, as used within the aggregators of the Accused Instrumentalities)
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	NTECH 002344 - NTECH 002347 (AWS graphic depicting a typical AWS Cloud architecture for web hosting, including a webserver)
'704 Patent Claim 3	
3. The method of claim 1, wherein the aggregator comprises software stored in a client memory device and adapted to be executed on a client processor.	See claim 1. Further, the TikTok App and the TikTok Servers including software supporting the TikTok App and Website, functions when a user installs software to a client memory device, such as a cell phone. As depicted below, the TikTok App including its supporting software may be downloaded on an apple mobile device TikTok App and its supporting software is downloaded within Windows Phone Store, Amazon App Store, and Google Play.



1. Your Relationship With Us
2. Accepting the Terms
3. Changes to the Terms
4. Your Account with Us
5. Your Access to and Use of Our Services
6. Intellectual Property Rights
7. Content
8. Indemnity
9. EXCLUSION OF WARRANTIES
10. LIMITATION OF LIABILITY
11. Other Terms
12. Dispute Resolution
- 13. App Stores**
14. Contact Us

Windows Phone Store.

By downloading the Platform from the Windows Phone Store (or its successors) operated by Microsoft, Inc. or its affiliates, you specifically acknowledge and agree that:

- You may install and use one copy of the Platform on up to five (5) Windows Phone enabled devices that are affiliated with the Microsoft account you use to access the Windows Phone Store. Beyond that, we reserve the right to apply additional conditions or charge additional fees.
- You acknowledge that Microsoft Corporation, your phone manufacturer and network operator have no obligation whatsoever to furnish any maintenance and support services with respect to the Platform.

Amazon Appstore.

By downloading the Platform from the Amazon Appstore (or its successors) operated by Amazon Digital Services, Inc. or affiliates ("Amazon"), you specifically acknowledge and agree that:

- to the extent of any conflict between (a) the Amazon Appstore Terms of Use or such other terms which Amazon designates as default end user license terms for the Amazon Appstore ("Amazon Appstore EULA Terms"), and (b) the other terms and conditions in these Terms, the Amazon Appstore EULA Terms shall apply with respect to your use of the Platform that you download from the Amazon Appstore, and
- Amazon does not have any responsibility or liability related to compliance or non-compliance by TikTok or you (or any other user) under these Terms or the Amazon Appstore EULA Terms.

Google Play.

By downloading the Platform from Google Play (or its successors) operated by Google, Inc. or one of its affiliates ("Google"), you specifically acknowledge and agree that:

- to the extent of any conflict between (a) the Google Play Terms of Services and the Google Play Business and Program Policies or such other terms which Google designates as default end user license terms for Google Play (all of which together are referred to as the "Google Play Terms"), and (b) the other terms and conditions in these Terms, the Google Play Terms shall apply with respect to your use of the Platform that you download from Google Play, and
- you hereby acknowledge that Google does not have any responsibility or liability related to compliance or non-compliance by TikTok or you (or any other user) under these Terms or the Google Play Terms.

(NTECH 002049 - NTECH 002051 (Showing TikTok terms of service detailing the platforms that provide the TikTok App and software for download))

App Store Preview

This app is available only on the App Store for iPhone, iPad, and Apple Vision Pro.



TikTok 12+

Videos, Music & Live Streams

[TikTok Ltd.](#)

#1 in Entertainment

★★★★★ 4.7 • 17.3M Ratings

Free · Offers In-App Purchases

NTECH 002275 - NTECH 002282 (TikTok app store front within the Apple App Store)

The aggregators of the Accused Instrumentalities include software that is stored within a client memory device. This occurs when the various TikTok software versions are downloaded on, at least, a mobile phone. This software is compatible with specific devices and is adapted to be executed on a client processor. Specifically, for example, the software of the Accused Instrumentalities provided within the Apple App Store is adapted to be executed on the client processor of only an iOS device. Similarly, the software of the Accused Instrumentalities provided within Google Play is adapted to be executed on the client processor of an Android device, As depicted below.



1. Your Relationship With Us
2. Accepting the Terms
3. Changes to the Terms
4. Your Account with Us
5. Your Access to and Use of Our Services
6. Intellectual Property Rights
7. Content
8. Indemnity
9. EXCLUSION OF WARRANTIES
10. LIMITATION OF LIABILITY
11. Other Terms
12. Dispute Resolution
- 13. App Stores**
14. Contact Us

Windows Phone Store.

By downloading the Platform from the Windows Phone Store (or its successors) operated by Microsoft, Inc. or its affiliates, you specifically acknowledge and agree that:

- You may install and use one copy of the Platform on up to five (5) Windows Phone enabled devices that are affiliated with the Microsoft account you use to access the Windows Phone Store. Beyond that, we reserve the right to apply additional conditions or charge additional fees.
- You acknowledge that Microsoft Corporation, your phone manufacturer and network operator have no obligation whatsoever to furnish any maintenance and support services with respect to the Platform.

Amazon Appstore.

By downloading the Platform from the Amazon Appstore (or its successors) operated by Amazon Digital Services, Inc. or affiliates ("Amazon"), you specifically acknowledge and agree that:

- to the extent of any conflict between (a) the Amazon Appstore Terms of Use or such other terms which Amazon designates as default end user license terms for the Amazon Appstore ("Amazon Appstore EULA Terms"), and (b) the other terms and conditions in these Terms, the Amazon Appstore EULA Terms shall apply with respect to your use of the Platform that you download from the Amazon Appstore, and
- Amazon does not have any responsibility or liability related to compliance or non-compliance by TikTok or you (or any other user) under these Terms or the Amazon Appstore EULA Terms.

Google Play.

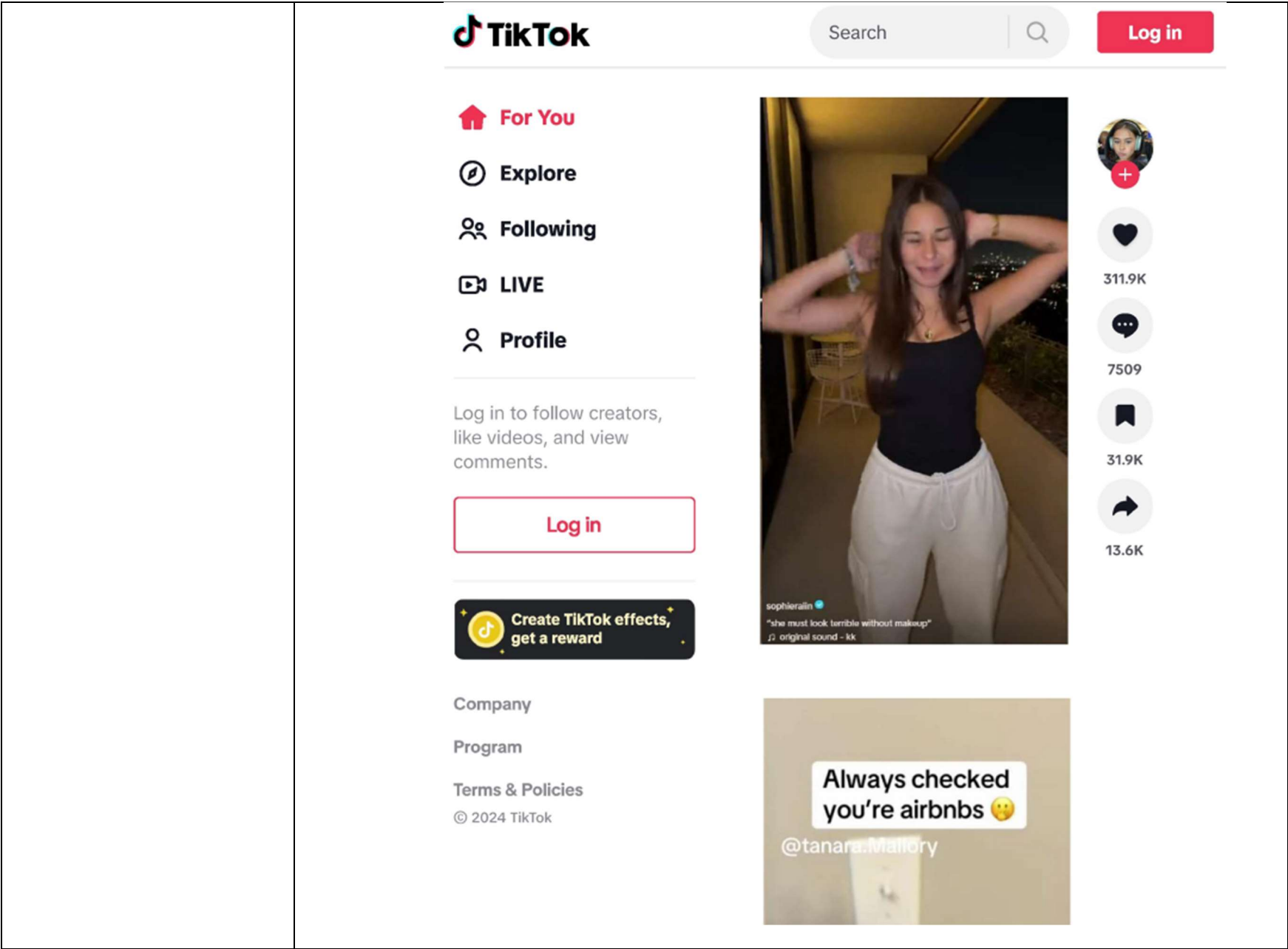
By downloading the Platform from Google Play (or its successors) operated by Google, Inc. or one of its affiliates ("Google"), you specifically acknowledge and agree that:

- to the extent of any conflict between (a) the Google Play Terms of Services and the Google Play Business and Program Policies or such other terms which Google designates as default end user license terms for Google Play (all of which together are referred to as the "Google Play Terms"), and (b) the other terms and conditions in these Terms, the Google Play Terms shall apply with respect to your use of the Platform that you download from Google Play, and
- you hereby acknowledge that Google does not have any responsibility or liability related to compliance or non-compliance by TikTok or you (or any other user) under these Terms or the Google Play Terms.

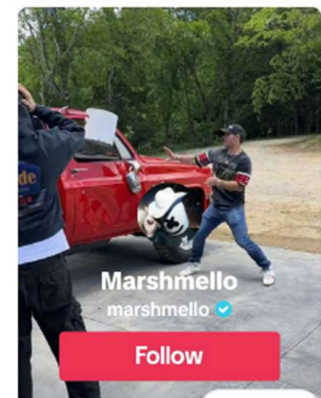
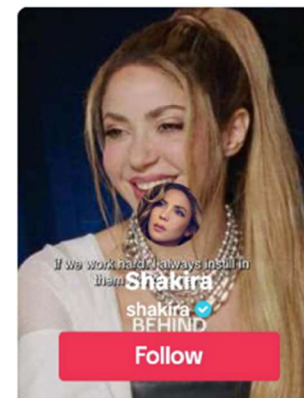
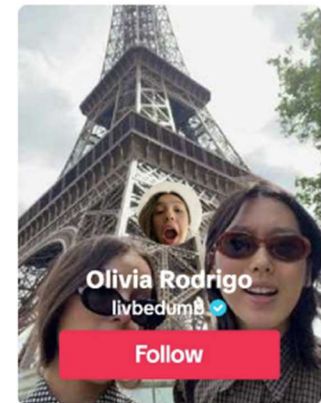
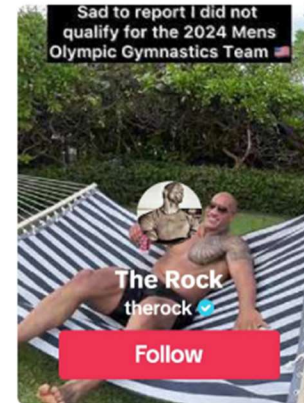
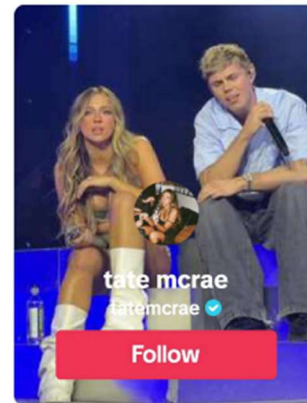
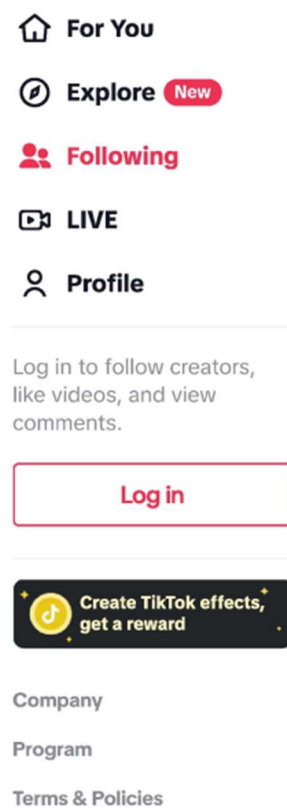
((NTECH 002049 - NTECH 002051 (Showing TikTok terms of service detailing the platforms that provide the TikTok App and software for download))

'704 Patent Claim 5	
5. The method of claim 1, wherein the user information comprises past usage information of the user.	See Claim 1. Further, the Accused Instrumentalities, use user information including past usage information of a user's, such as media elements liked, commented on, shared, viewed, accounts followed, and more by a user, as depicted below. For You Factors that may influence your For You feed include: • User interactions: Videos you like, share, or comment on, videos you watch in full or skip, accounts you follow, and accounts that follow you. • Video information: Captions, sounds, hashtags, number of video views, and the country the video was published. • User information: Device and account settings, language preference, country, time zone and day, and device type. We consider all these factors to predict how relevant and interesting content might be to a viewer. Different factors can play a larger or smaller role in what's recommended, and the importance—or weighting—of a factor can change over time. For instance, the time spent watching a specific video is generally weighted more heavily than other factors. However, if a viewer never finishes watching any videos, but watches a lot of videos posted by creators in the same region, then that region may have a relatively stronger weight compared to other factors for that viewer. Factors like device settings generally receive lower weight compared to other factors. NTECH 002226 - NTECH 002231 at NTECH 002229 (TikTok help center article describing the type of user information provided to TikTok publishers to generate media elements)
'704 Patent Claim 6	
6. The method of claim 1, wherein the media	See claim 1.

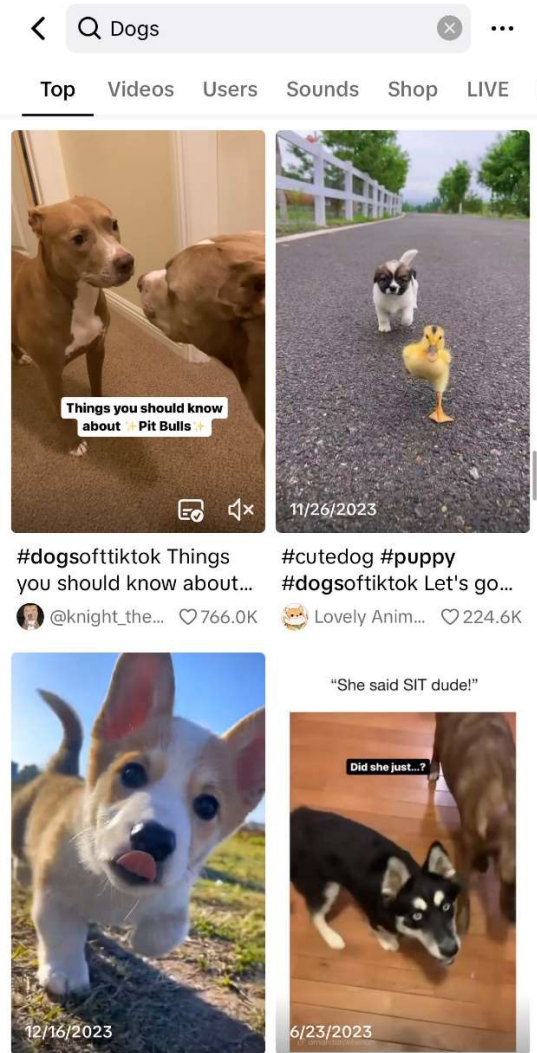
programming comprises a video feed.	Further, the Accused Instrumentalities curate video programming, consisting of media elements including videos, music and pictures. These streams are called feeds and include multiple iterations including the “For You” feed, “Following” feed, and the result of a search, as depicted below. Watching TikTok videos In a nutshell, like videos from Vine or Instagram, TikTok videos appear vertically on your screen. You can engage with them using “hearts”, which are the same as “likes.” After you download the TikTok app and open it, you’ll immediately see curated featured videos on the “for you” page. You can switch to the “following” page to see videos from users you follow - whether friends or popular TikTokers. NTECH 002624- NTECH 002630 (Article explaining how users request media programming by)
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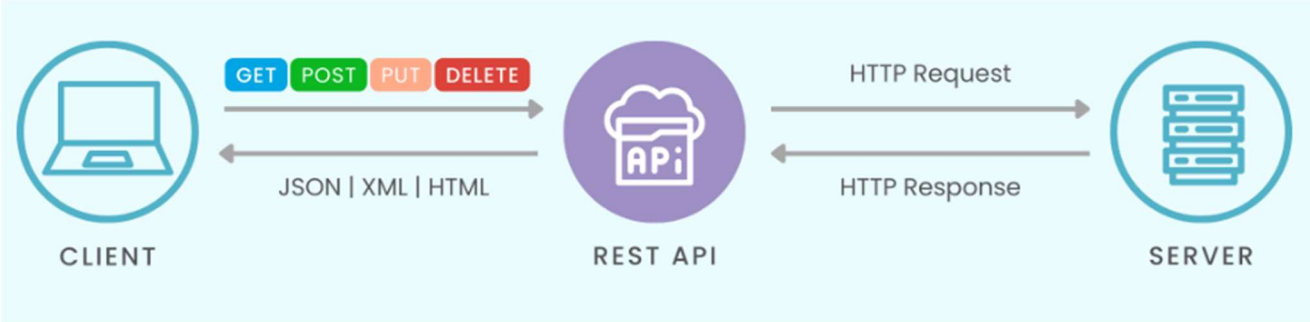
NTECH 002631-NTECH 002632 (Showing media elements generated within the “For You” feed displaying videos on the TikTok Website and displayed on a computer)

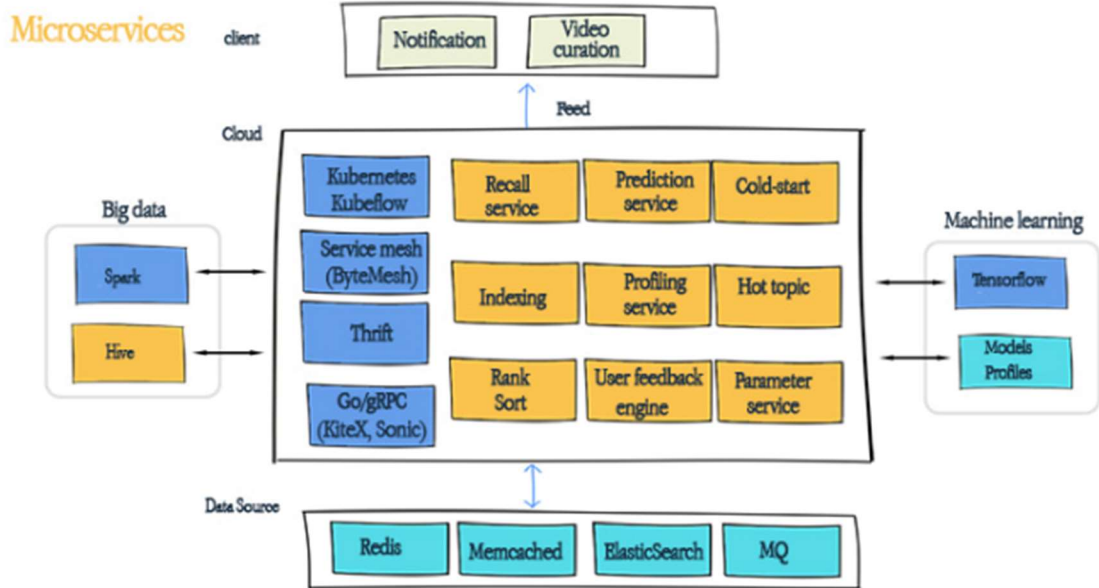


NTECH 002301-NTECH 002306 (Showing media elements generated within the “Following” feed displaying videos on the TikTok Website and displayed on a computer)



NTECH 002274 (Showing a menu of media clips, displayed within TikTok's search feed on a mobile phone)

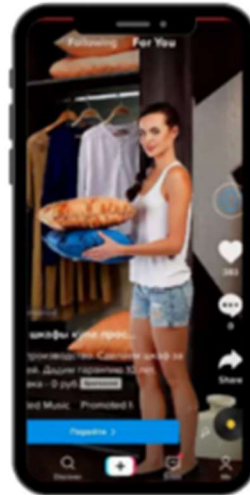
'704 Patent Claim 7	
7. The method of claim 1, wherein the step of providing the media programming comprises providing from a web server via a network to the client the media programming.	See Claim 1.
'704 Patent Claim 10	
10. The method of claim 1, further comprising providing by the aggregator a presentation element for presenting data indicative of a plurality of media streams to the user, and, responsive to a user selection of one of the presented media streams, providing by the aggregator the selected media stream in the media programming.	See claim 1. Further, the system of web servers (hosted by the aggregators of the Accused Instrumentalities) provide presentation elements including webpage data elements (i.e HTML webpages) and application data elements (i.e JSON data packets). This data is provided by the aggregator in response to a user's selection of a media element within one of the media streams of the Accused Instrumentalities.  (https://www.skiplelevel.co/blog/part-2-rest-api-components-how-to-read-them Graphic showing the process of a JSON request and response)

	 NTECH 002605 - NTECH 002615 at NTECH 002610 Graphic showing TikTok's microservices including Sonic, an enhanced JSON library)
'704 Patent Claim 14	
14. The method of claim 1, wherein the data related to the plurality of media streams comprises categorizing data associated with media elements of the media streams indicative of subjectively determined character of the media element	See claim 1. Further, as depicted below, categorizing data of the Accused Instrumentalities (such as metadata) is associated with each media elements included in a media stream. This metaata is subjectively determined by the character of each media element, such as how, when, where and by whom the piece of data was created, collected, or modified and how the media is formatted.

	• Metadata. When you upload or create User Content, you automatically upload certain metadata that is connected to the User Content. Metadata describes other data and provides information about your User Content that will not always be evident to the viewer. For example, in connection with your User Content the metadata can describe how, when, where, and by whom the piece of User Content was created, collected, or modified and how that content is formatted. It also includes information, such as your account name, that enables other users to trace back the User Content to your user account. Additionally, metadata includes data that you choose to provide with your User Content, e.g., any hashtags used to mark keywords to the video and captions. NTECH 002454 (describing categorizing metadata)
'704 Patent Claim 15	
15. The method of claim 14, wherein the user information comprises viewing history, user preference data and search queries.	See claim 14. Further, media programming displayed within the feeds of the Accused Instrumentalities are determined by user information such as viewing history (media programming watched by a user), preference data (media liked by a user) and queries (previous media searched for and viewed by a user) as depicted below.

	Why a video is recommended on your For You feed At TikTok, we want to help you understand why certain videos appear on your For You feed. That's why we share this information on each video in the feed. To learn why a video is recommended to you: 1. In the TikTok app, tap the Share button on the side of a video in the For You feed. 2. Tap Why this video. We'll list some reasons why a video shows up on your feed, such as: ◦ You commented on, liked, shared, or watched similar videos ◦ This video is popular in your country ◦ This video was posted recently ◦ This video is longer, and you seem to like longer videos ◦ You're following this creator Keep in mind, if you've recently refreshed your For You feed, you'll see a variety of videos while we learn your preferences to launch your new personalized feed. NTECH 002226 - NTECH 002231 at NTECH 002229 (TikTok help center article describing the type of user activity stored within TikTok's databases that influences subsequent media programming, including similar videos watched by a user)
'704 Patent Claim 16	
16. The method of claim 14, further comprising deriving by the aggregator keywords from the media streams, deriving by the aggregator from the derived keywords further keywords from a map of synonyms, and employing the further derived keywords in	See claim 14. Further, the aggregators of the Accused Instrumentalities (frontend and backend servers), store metadata (which includes keywords) attached to each media element. When a user requests media programming by a search, the aggregators identify and produce media programming with metadata linked to the requested keyword. Further, the aggregators identify more media by processing the keyword searched to produced synonyms, and then identifying media elements connected to these synonyms (by the metadata of the synonym) in a temporal sequence, as depicted below.

determining the temporal sequence.	• Metadata. When you upload or create User Content, you automatically upload certain metadata that is connected to the User Content. Metadata describes other data and provides information about your User Content that will not always be evident to the viewer. For example, in connection with your User Content the metadata can describe how, when, where, and by whom the piece of User Content was created, collected, or modified and how that content is formatted. It also includes information, such as your account name, that enables other users to trace back the User Content to your user account. Additionally, metadata includes data that you choose to provide with your User Content, e.g., any hashtags used to mark keywords to the video and captions. NTECH 002452 (Describing metadata linked to data (media elements))
'704 Patent Claim 17	
17. The method of claim 1, wherein at least one of the media streams comprises media elements having labels indicative of payment due from an advertiser and payment due to a content provider.	See claim 1. Further, the Accused Instrumentalities produce media streams known as feeds. These feeds, comprise media elements which are in feed advertisement, as depicted below.

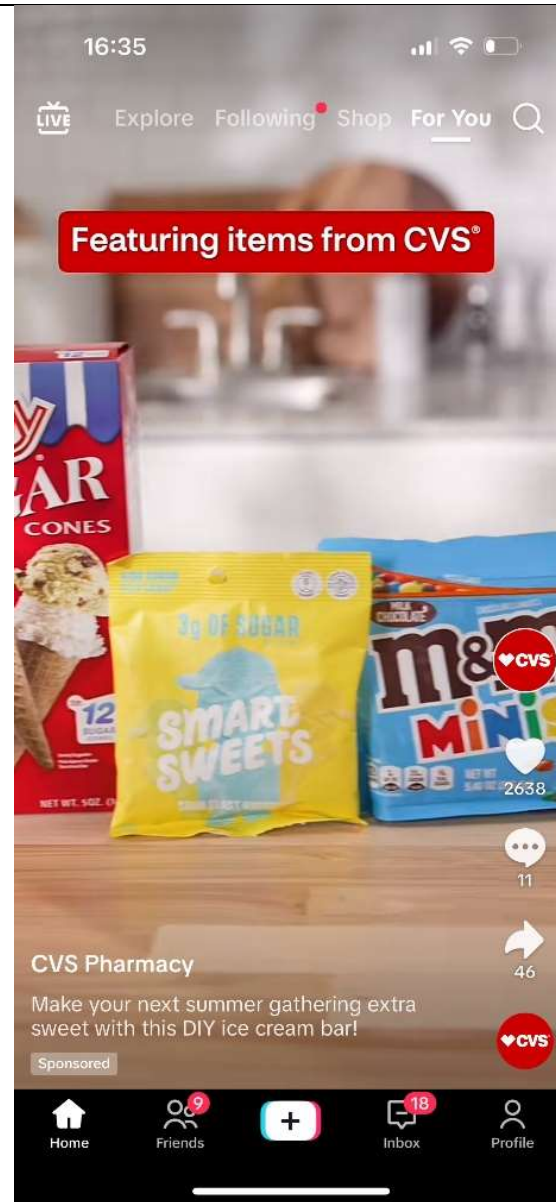


In-Feed Ads

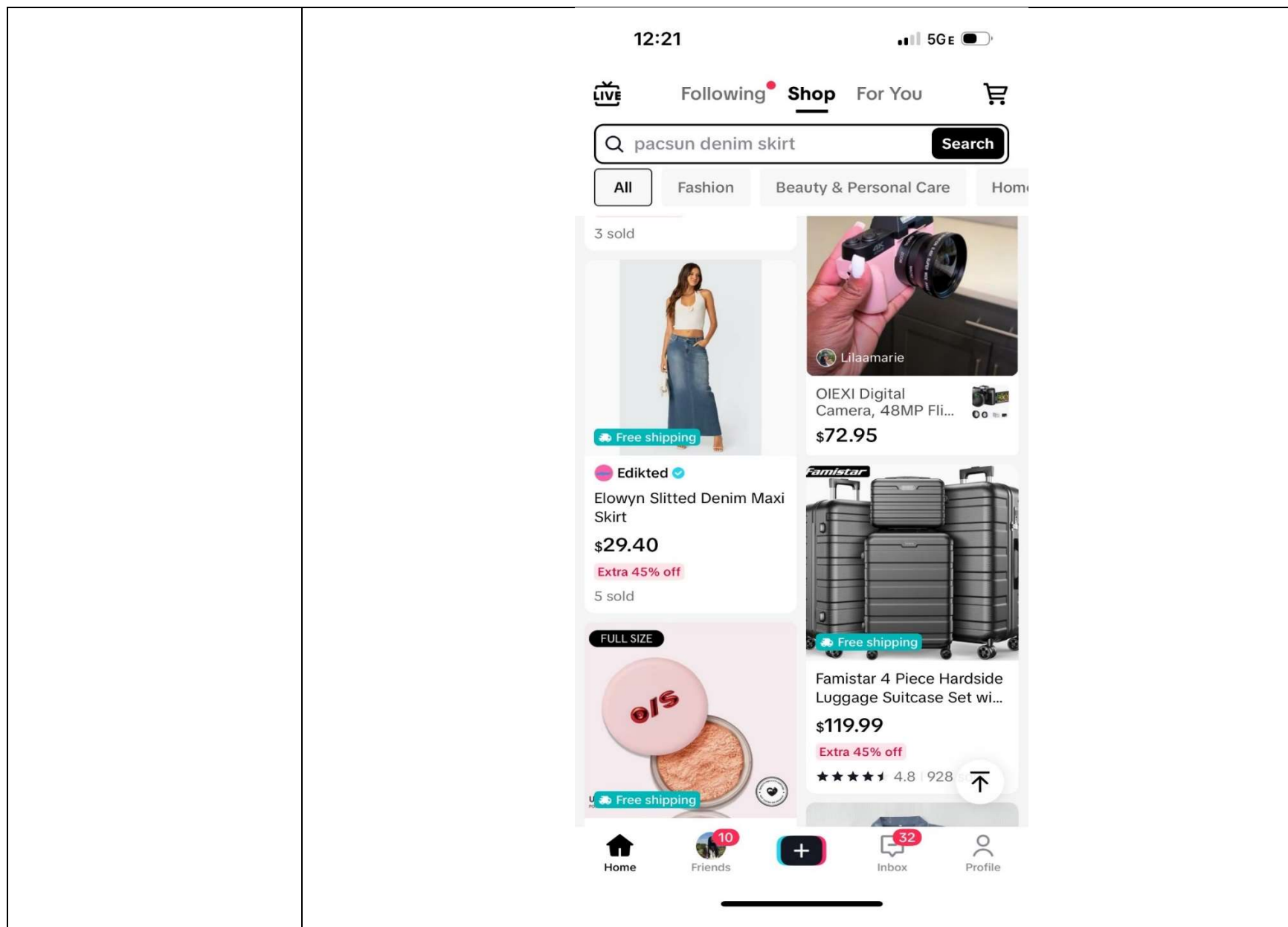
- 9-15 secs long vertical video ads on 'For You' page
- Skippable, native ad format
- Supports call-to-actions and URL visit.
- CPM buying with gender and location targeting

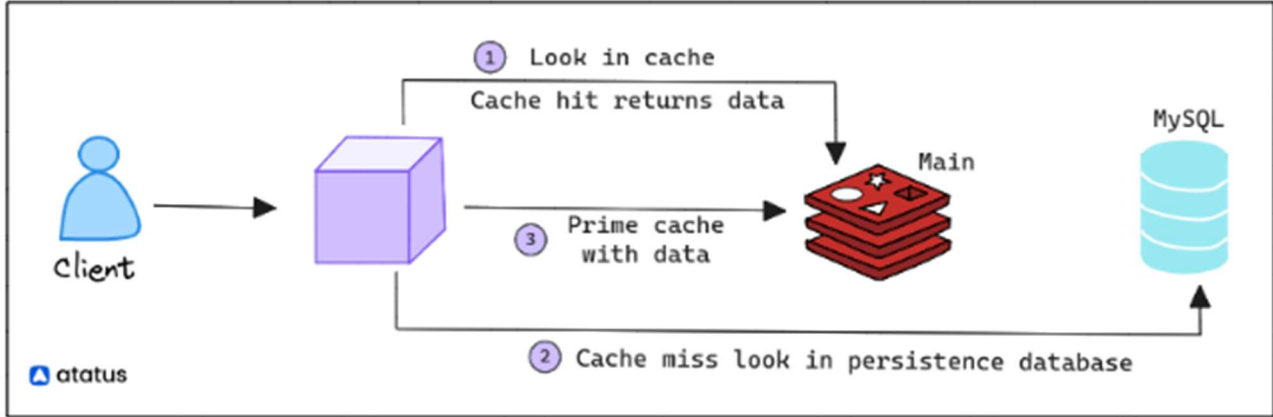
NTECH 002314-2324 at NTECH 2315 (TikTok in-feed ads)

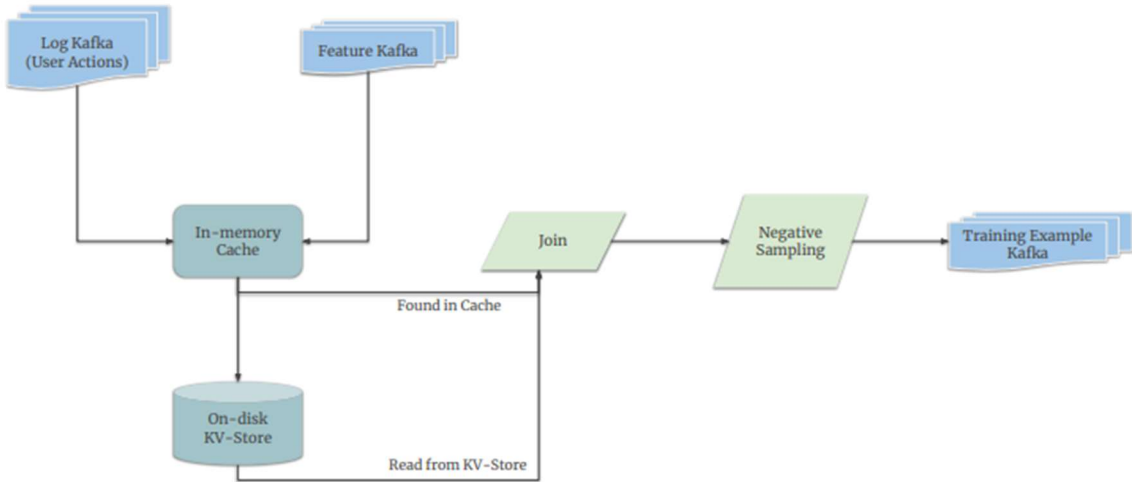
These advertisements must be paid for by an advertiser. Accordingly, these advertisements include a label indicative of payments due from an advertiser (the “sponsored” label is attached to an advertisement to show payment due for that advertisement media element).



	NTECH 002285 (An advertisement presented within the “For You” feed and displayed on the TikTok app on a mobile phone the “Sponsored” label indicative of payment due from an advertiser) Further, labels, such as a price tags, indicative of a payment due to a content provided is shown within the advertisements displayed on a TikTok feed such as the TikTok Shop (and other feeds such as “For You” and “Following” feeds), as depicted below.
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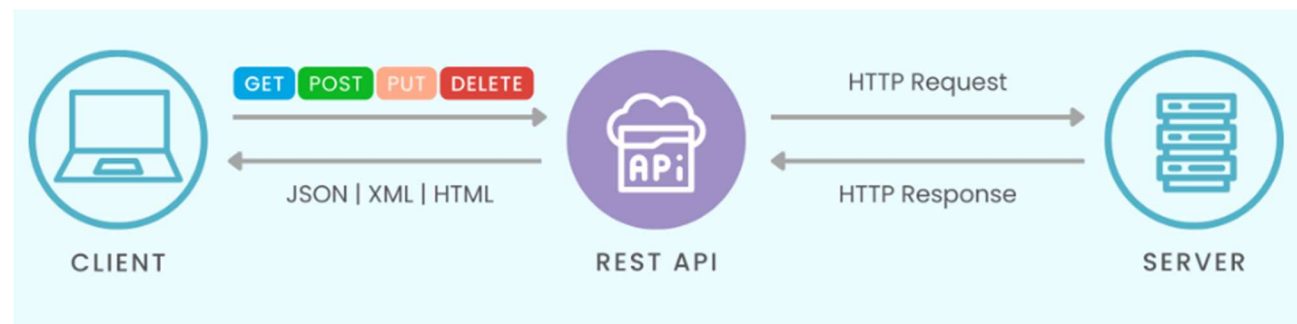
	NTECH 002670 (Showing price tag labels indicative of a payment owed to a content provider, displayed within TikTok Shop feed on a mobile phone)
'704 Patent Claim 18	
18. The method of claim 1, further comprising caching by the aggregator the media streams prior to providing the elements in the media programming, whereby switching between streams at optimal times is facilitated	See claim 1. Further, the Accused Instrumentalities utilize a key value database. As depicted by the excerpt below a key value database like Redis acts as a database cache storing previously accessed data to retrieved such data in the future. This previous data may include a previous search for video programming requested by a user and the resulting media programming. When a user makes a second request for video programming, the aggregator is able to retrieve media programming from the stored data within a cache database like Redis of the Accused Instrumentalities, instead of a relational database of the Accused Instrumentalities. This leads to the production of video programming, to enable an optimal time for switching between streams.  NTECH 002468 - NTECH 002493 at NTECH 002473 (A graphic depicting data retrieved from a database cache like Redis (labeled as Main) and in memory cache, following a request by a user using a client device)

	 Figure 5: Online Joiner. NTECH 002264 - NTECH 002273 at NTECH 002268 (A research paper by Bytedance Inc. detailing Monolith, a recommendation system used by TikTok which connects user action with data associated with content or features, in real time, known as an online joiner to produce video programming)
'704 Patent Claim 19	
19a. A system for providing media programming, comprising:	See Claim 1.
19b. an aggregator having a memory and a processor, the processor adapted for presenting a plurality of media streams to a user, receiving a signal having	The Accused Instrumentalities operate aggregators. TikTok's aggregators are TikTok's servers powering its recommendation engine i.e frontend servers and backend servers or a combination of both (TikTok's frontend and backend server include TikTok's web servers, application servers and database servers).

data indicative of a selection of one of the media streams, and providing an output signal including data indicative of the selection and of user data; and

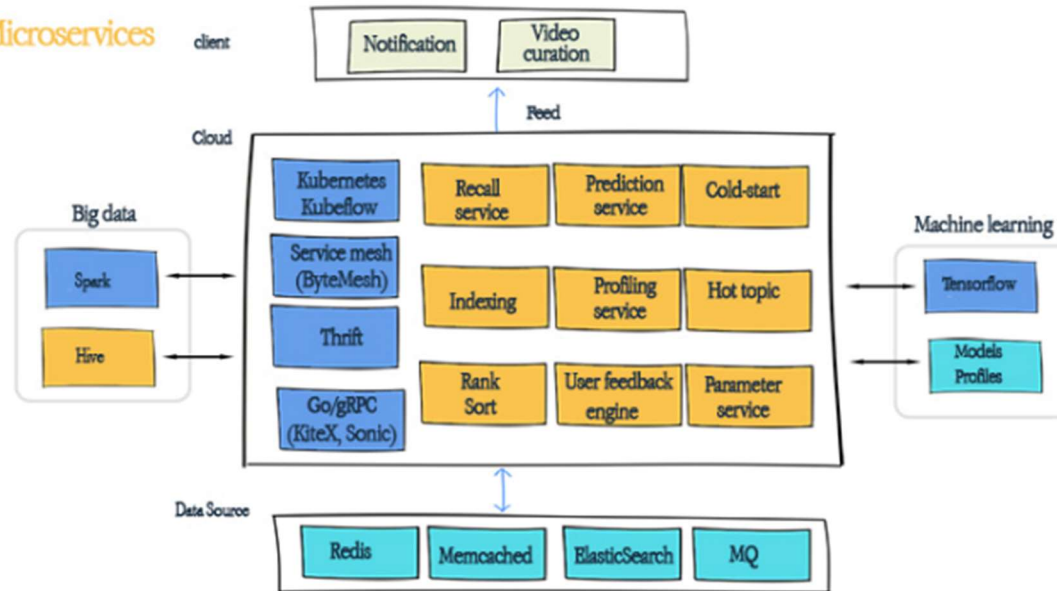
The aggregator of the Accused Instrumentalities has a memory and a processor. The processor (CPU) hosts the network of web servers of the Accused Instrumentalities which are adapted to present a plurality of media streams to a user by displaying a requested webpage on a user device.

A user receives and selects from a plurality of media streams, when data packets and webpage information (in a JSON format and a HTML format) are transferred between TikTok's webservers, the TikTok Application and the TikTok Webpage over a signal which is an internet network facilitated by API's, as depicted below.



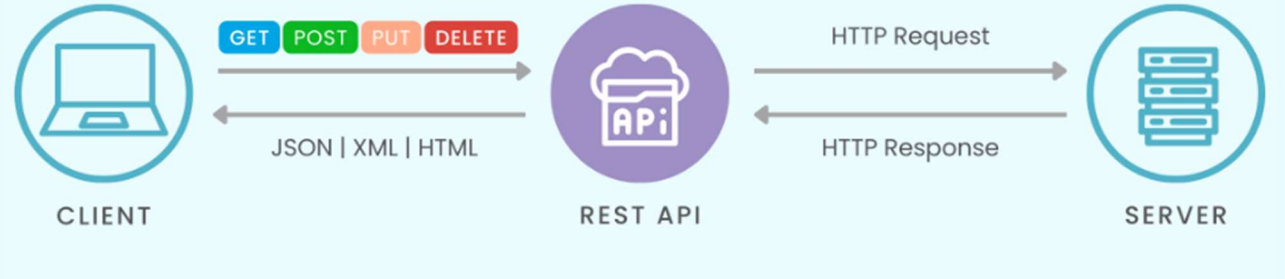
NTECH 002711 – NTECH 002719 (<https://www.skiplevel.co/blog/part-2-rest-api-components-how-to-read-them> Graphic showing the process of a JSON request and response)

Microservices

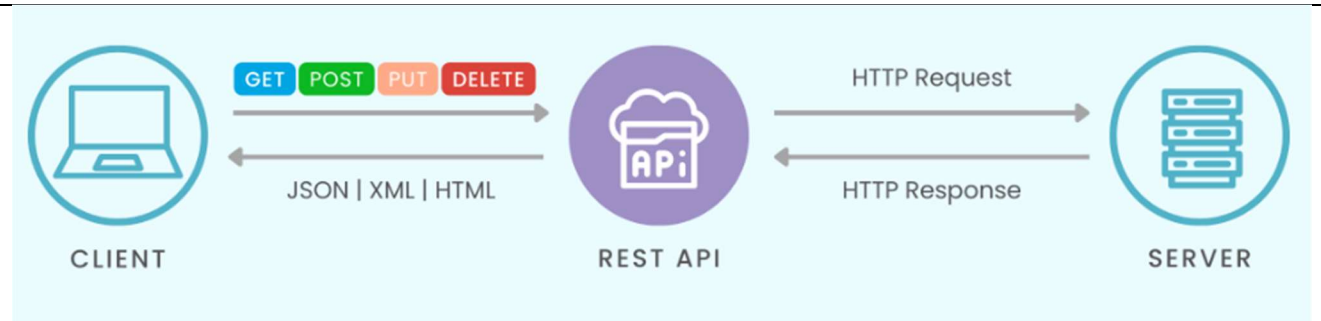


NTECH 002605 - NTECH 002615 at NTECH 002610 Graphic showing TikTok's microservices including Sonic, an enhanced JSON library)

When a user selects a media element presented within a media stream, such as a video or an image, this selection is received by the aggregator of the accused instrumentalities, which are a combination of TikTok servers. This selection is transferred from a client device by API's to its web servers which in turn provides an output signal including data indicative of the selection and of user data, as depicted below.

	 NTECH 002711 – NTECH 002719 (https://www.skiplevel.co/blog/part-2-rest-api-components-how-to-read-them Graphic showing the process of a JSON request and response)
19c. a publisher having a memory and a processor, the publisher processor adapted to receive the output signal from the aggregator, and, responsive to the data indicative of the selection and of user data, access from the memory at least one algorithm for selection and sequencing of media elements, select a temporal sequence of media programming comprising the selected media stream and other media elements based on an output of the algorithm using the selection and the user data, assemble the selected media stream and the other media	The Accused Instrumentalities operate aggregators. TikTok’s aggregators are TikTok’s servers powering its recommendation engine i.e frontend servers and backend servers or a combination of both (TikTok’s frontend and backend server include TikTok’s web servers, application servers and database servers). The aggregator of the Accused Instrumentalities has a memory and a processor. The processor (CPU) hosts the network of web servers of the Accused Instrumentalities which are adapted to present a plurality of media streams to a user by displaying a requested webpage on a user device. When a user selects a media element presented within a media stream, such as a video or an image, this selection is received by the aggregator of the accused instrumentalities, which are a combination of TikTok servers. This selection is transferred from a client device by API’s to its web servers which in turn provides an output signal including data indicative of the selection and of user data, as depicted below.

elements in the temporal sequence, and provide media programming to the user including the assembled media stream and other media elements in the temporal sequence.



NTECH 002711 – NTECH 002719 (<https://www.skiplevel.co/blog/part-2-rest-api-components-how-to-read-them>) Graphic showing the process of a JSON request and response)

Data indicative of a user's selection is accessed from the memory (TikTok's databases, hard drive, RAM). TikTok Servers receive the resulting data from the memory in the as data packets (in a JSON format) and simultaneously communicate with various TikTok microservices which host the TikTok algorithm.

As depicted below, TikTok's algorithms use its microservices (Kubeflow, Kubernetes, KFServing etc.) to select and create a temporal sequence of media elements resulting in assembled media stream. This media programming is delivered to a user's client device, as depicted below.

 **ByteDance**

Teams

Locations

Blog

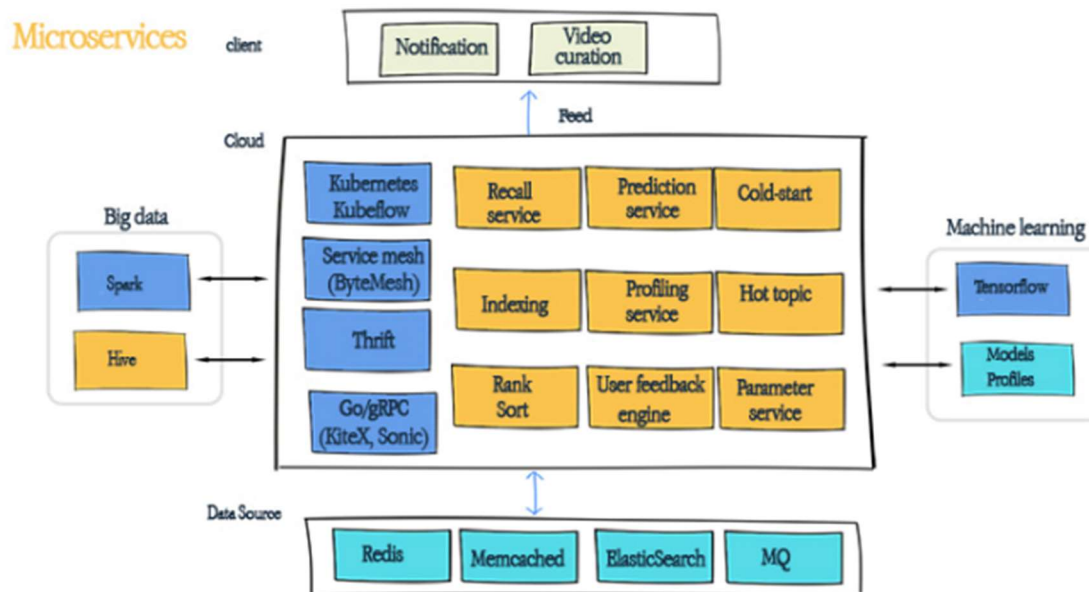
Early Careers

Jobs

Sign in

Our database development team is responsible for building and owning database products used by TikTok's infrastructure including but not limited to relational databases, key-value stores, and document stores. In this team, you'll have the opportunity to develop and enhance serverless DBMS service in a cloud-native environment. We embrace a culture of self-direction, intellectual curiosity, openness, and problem-solving.

NTECH 002499 – 002502 NTECH (Describing TikTok’s database infrastructure used to organize and store data on The Accused Instrumentalities)



NTECH 002605 - NTECH 002615 at NTECH 002610 (Graphic showing TikTok’s microservices including Kubernetes and KubeFlow)

**'704 Patent
Claim 20**

20. he system of claim 19, wherein the aggregator comprises a web server, the aggregator processor being adapted to present a web page listing the media streams for display on a client device.

The aggregator of the Accused Instrumentalities has a memory and a processor. The processors host the web server of the Accused Instrumentalities which are adapted to present a plurality of media streams to a user by displaying a requested webpage on a user device.

As depicted below, the Accused Instrumentalities rents its web servers from webhosting providers. The cloud server software used by the Accused Instrumentalities include TikTok’s cloud infrastructure,

Google Cloud Platform, AWS, Alibaba Cloud, Data Camo, Microsoft Azure, Oracle cloud, and/or other cloud infrastructure, are its web servers.

Data Storage for U.S. Users

As of July 2022, all new U.S. user data is stored automatically in [Oracle's U.S. Cloud infrastructure](#), and access is managed exclusively by the TikTok US Data Security team. USDS is dedicated to making every U.S. user on TikTok feel safe and confident their data is secure and that the platform is free from outside influence. To help ensure that there is no unauthorized access to our systems, such as no "backdoors" or data leakage, Oracle and a third-party source code inspector will work to ensure that everything is performing as intended.

NTECH 002028 (Stating TikTok's use of Cloud servers to store data)

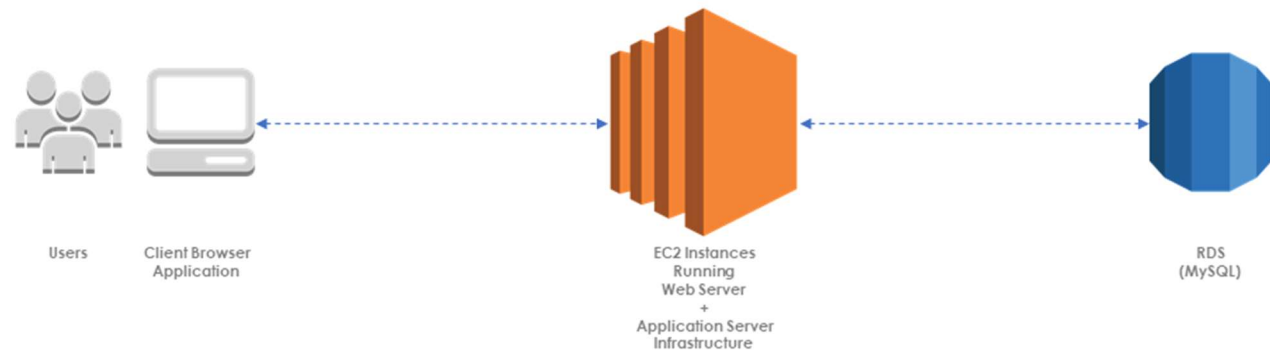
HOSTING

Cloud hosting vendors like AWS and Microsoft Azure provide cloud-based computing and network resources to deliver applications. The hosting platforms used by **TikTok** are summarized below by geographical points-of-presence (PoP). Each PoP can host many IPs to deliver an application.

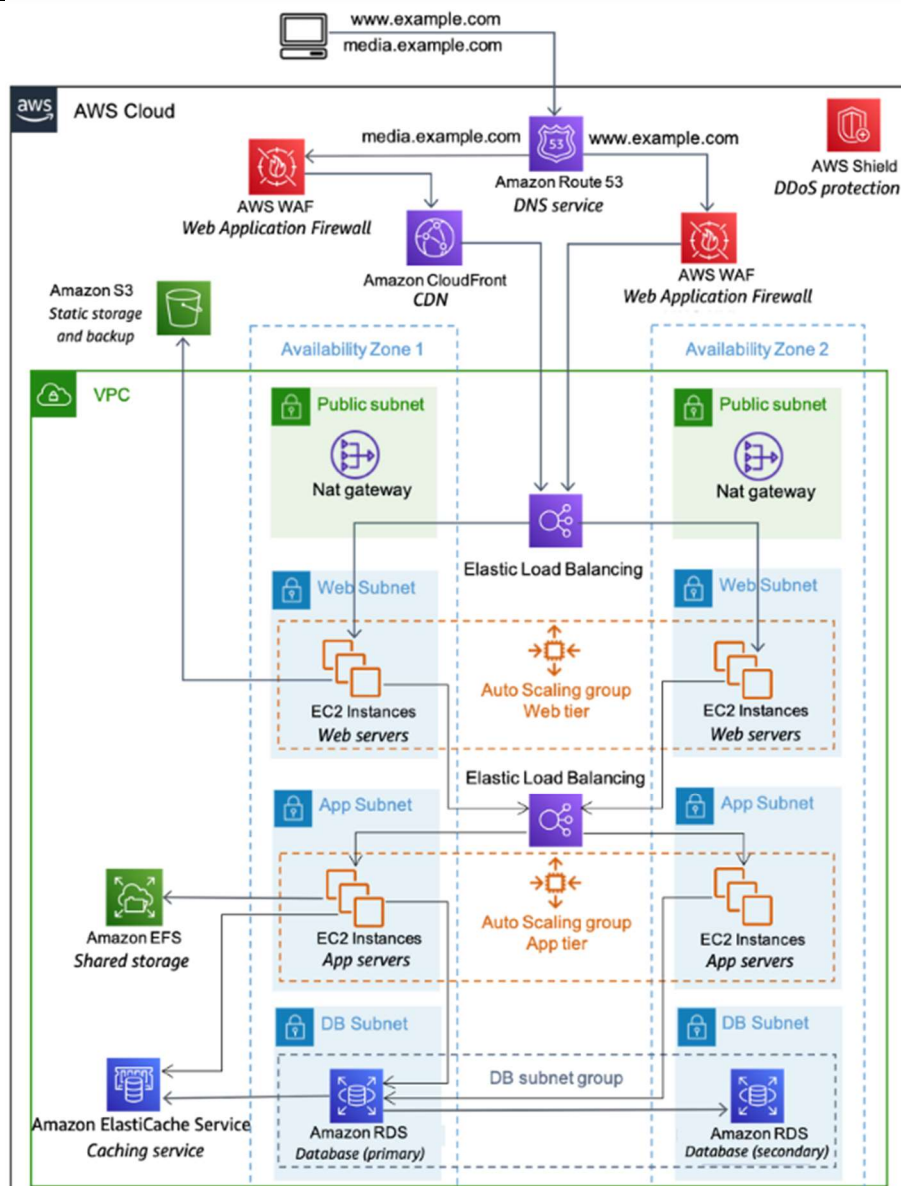
Cloud Hosts	# of IPs
 Google Cloud Platform	17
 Oracle Cloud	44
 DataCamp	235
 Volcengine	83
 Kaopu Cloud	7
 Microsoft Azure	1
 Zenlayer	25
 Alibaba Cloud	19
 Amazon AWS	3

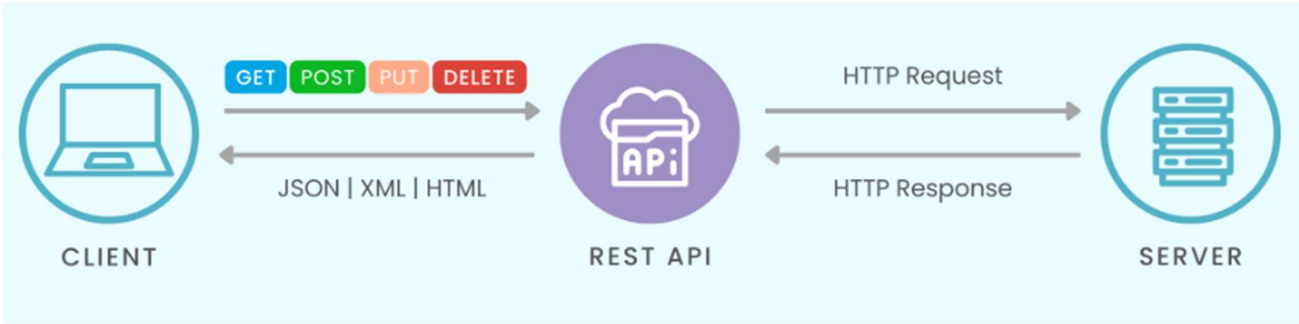
NTECH 002528 – NTECH 00255 (Article listing the cloud webserver platform used by the Accused Instrumentalities)

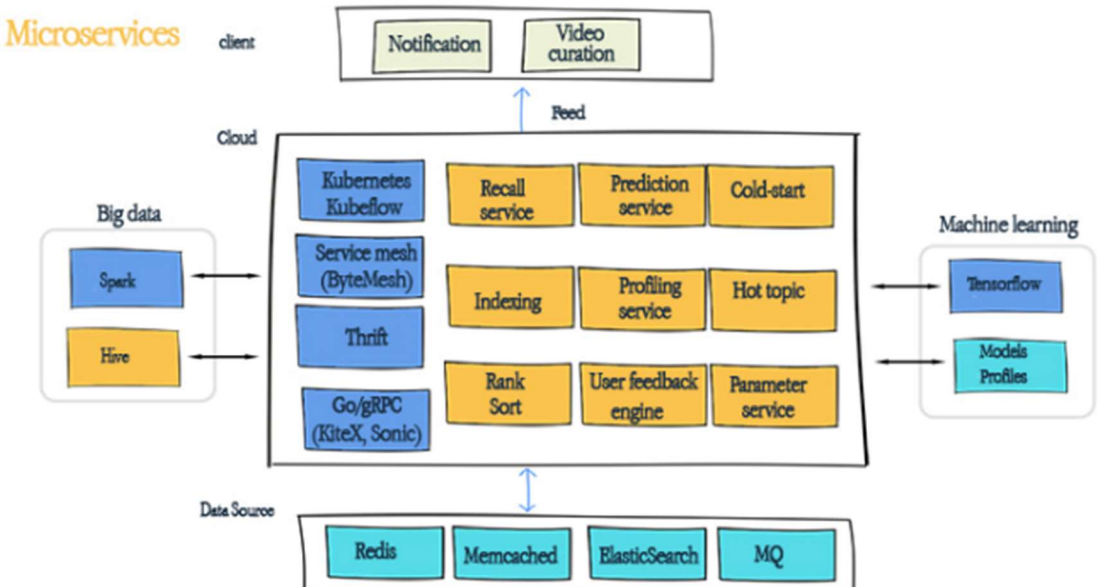
The aggregator of the Accused Instrumentalities comprises TikTok’s cloud-based web servers for delivering web pages on a client. Various servers i.e app servers, web servers, data servers and more are comprised within the aggregator of the Accused Instrumentalities, as depicted below.



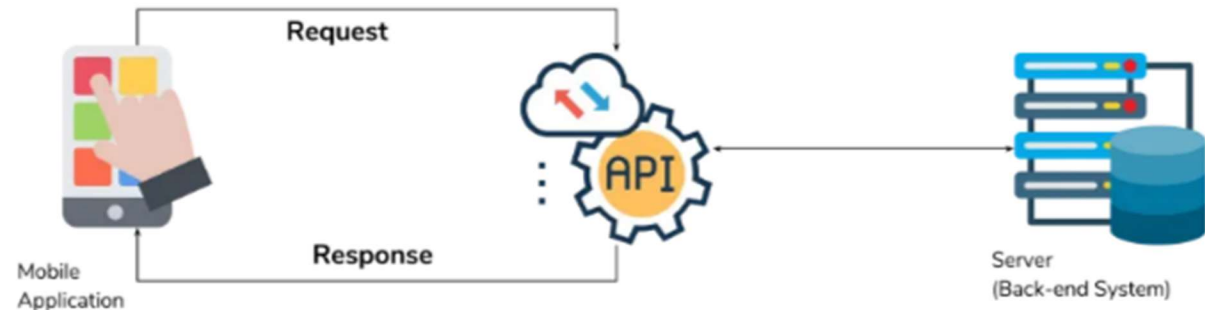
NTECH 002232 – NTECH 002241(Graphic depicting the use of a web server in a client server architecture, as used within the aggregators of the Accused Instrumentalities)



	NTECH 002344 - NTECH 002347 (AWS graphic depicting a typical AWS Cloud architecture for web hosting, including a webserver)
'704 Patent Claim 21	
21. The system of claim 20, wherein the publisher comprises a web server, and wherein the aggregator processor is adapted to redirect a client device to the publisher web server.	The aggregator processor is adapted to redirect a client device to the publisher web server when a user requests and receives media programming. As depicted below, data packets and webpage information (in a JSON format and a HTML format) are redirected from a webserver to a client device. Particularly, TikTok's webserver direct data and webpage information to the TikTok Application and the TikTok Webpage over a signal which is an internet network facilitated by API's.  <pre> graph LR CLIENT[CLIENT] -- "GET POST PUT DELETE" --> REST_API[REST API] REST_API -- "HTTP Request" --> SERVER[SERVER] SERVER -- "HTTP Response" --> REST_API REST_API -- "JSON XML HTML" --> CLIENT </pre> NTECH 002711 – NTECH 002719 (https://www.skiplevel.co/blog/part-2-rest-api-components-how-to-read-them Graphic showing the transfer of user selection data and information from a client device to a server and the reverse)

	 NTECH 002605 - NTECH 002615 at NTECH 002610 (Graphic showing TikTok's microservices including Sonic, an enhanced JSON library)
'704 Patent Claim 22	
22. The system of claim 19, wherein in response to the selection, the publisher provides a first media stream having content from concatenated elements of at least second and third media streams, and, in response to a further user selection, provides content preferentially from one of	TikTok Servers select a collection of first video clips corresponding with a user request. As shown below, the publishers (which are TikTok web servers) of the Accused Instrumentalities provide a first media stream to a client device. The media stream provided by the publisher is in the form of a concatenated stream of media elements (videos, pictures, music, and combination of the three). The concatenated elements of the first media stream have content that is then placed into second and third media streams.

the second and third media streams.



NTECH 002617- NTECH 002623 at NTECH 002619 (Depicting the process of a request and response client architecture, in which a user request is received by the backend including servers (publishers) to deliver streams of media to a client device)

For You

Factors that may influence your For You feed include:

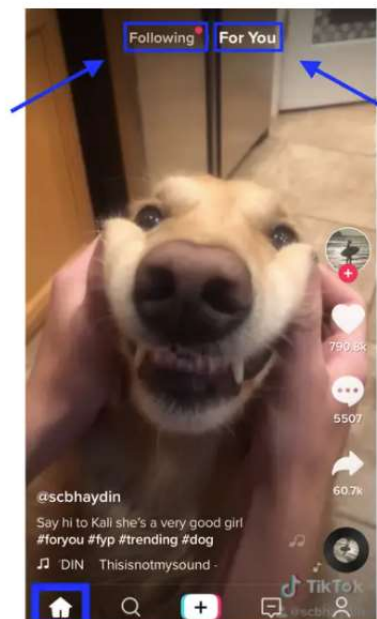
- **User interactions:** Videos you like, share, or comment on, videos you watch in full or skip, accounts you follow, and accounts that follow you.
- **Video information:** Captions, sounds, hashtags, number of video views, and the country the video was published.
- **User information:** Device and account settings, language preference, country, time zone and day, and device type.

We consider all these factors to predict how relevant and interesting content might be to a viewer. Different factors can play a larger or smaller role in what's recommended, and the importance—or weighting—of a factor can change over time. For instance, the time spent watching a specific video is generally weighted more heavily than other factors. However, if a viewer never finishes watching any videos, but watches a lot of videos posted by creators in the same region, then that region may have a relatively stronger weight compared to other factors for that viewer. Factors like device settings generally receive lower weight compared to other factors.

	NTECH 002226 - NTECH 002231 at NTECH 002229 (TikTok help center article describing the type of user information provided to TikTok’s publishers to generate media elements) The Accused Instrumentalities use information from previous media elements viewed by a user, user interaction and user information to provide preferential content (videos, pictures, music, and combination of the three) to a user within, for instance, previous media streams on the “For You” feed which are second and third media stream. As depicted below, features of the first video clips, including at least, subject matter, length, location, description and title, are used to recommend second video clips which are found in a stream of media content known as TikTok’s “For You” feed. Why a video is recommended on your For You feed At TikTok, we want to help you understand why certain videos appear on your For You feed. That's why we share this information on each video in the feed. To learn why a video is recommended to you: 1. In the TikTok app, tap the Share button on the side of a video in the For You feed. 2. Tap Why this video. We'll list some reasons why a video shows up on your feed, such as: ◦ You commented on, liked, shared, or watched similar videos ◦ This video is popular in your country ◦ This video was posted recently ◦ This video is longer, and you seem to like longer videos ◦ You're following this creator Keep in mind, if you've recently refreshed your For You feed, you'll see a variety of videos while we learn your preferences to launch your new personalized feed. NTECH 002226 - NTECH 002231 at NTECH 002229 (TikTok help center article describing the type of user information provided to TikTok’s publishers to generate media elements)
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As depicted by the excerpt below, the Accused Instrumentalities will generate multiple media streams, including the “For You” and “Following” feeds as well as advertising feeds, Duets, and Stitching. The feeds are concatenated to display media programming or content, connected to each other to produce a chain of media programming.

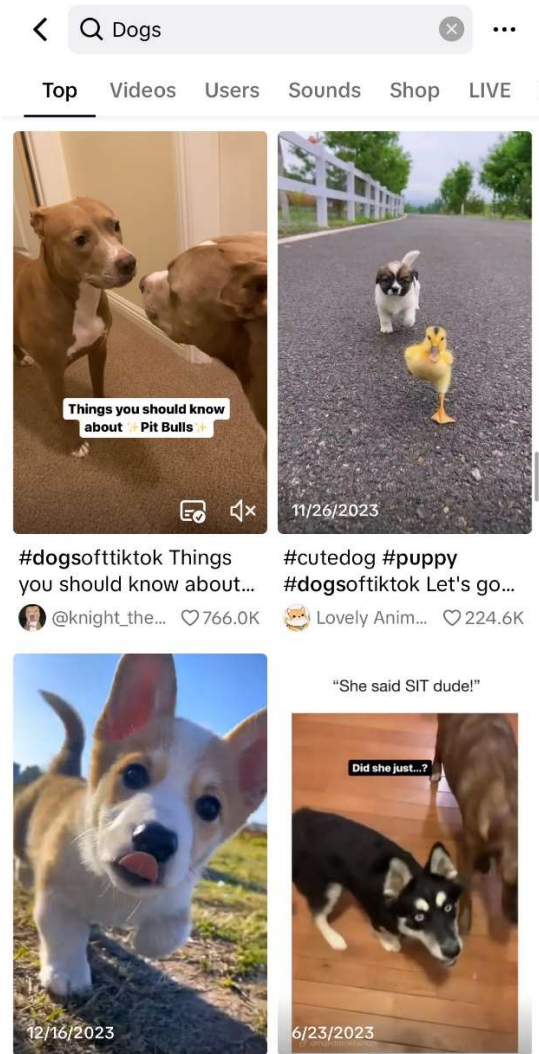
The TikTok home page, where your feed lives, is split up into two sections: "following," to only see content from users you follow, and "for you," which amasses popular content from across TikTok, similar to Instagram's Explore page.



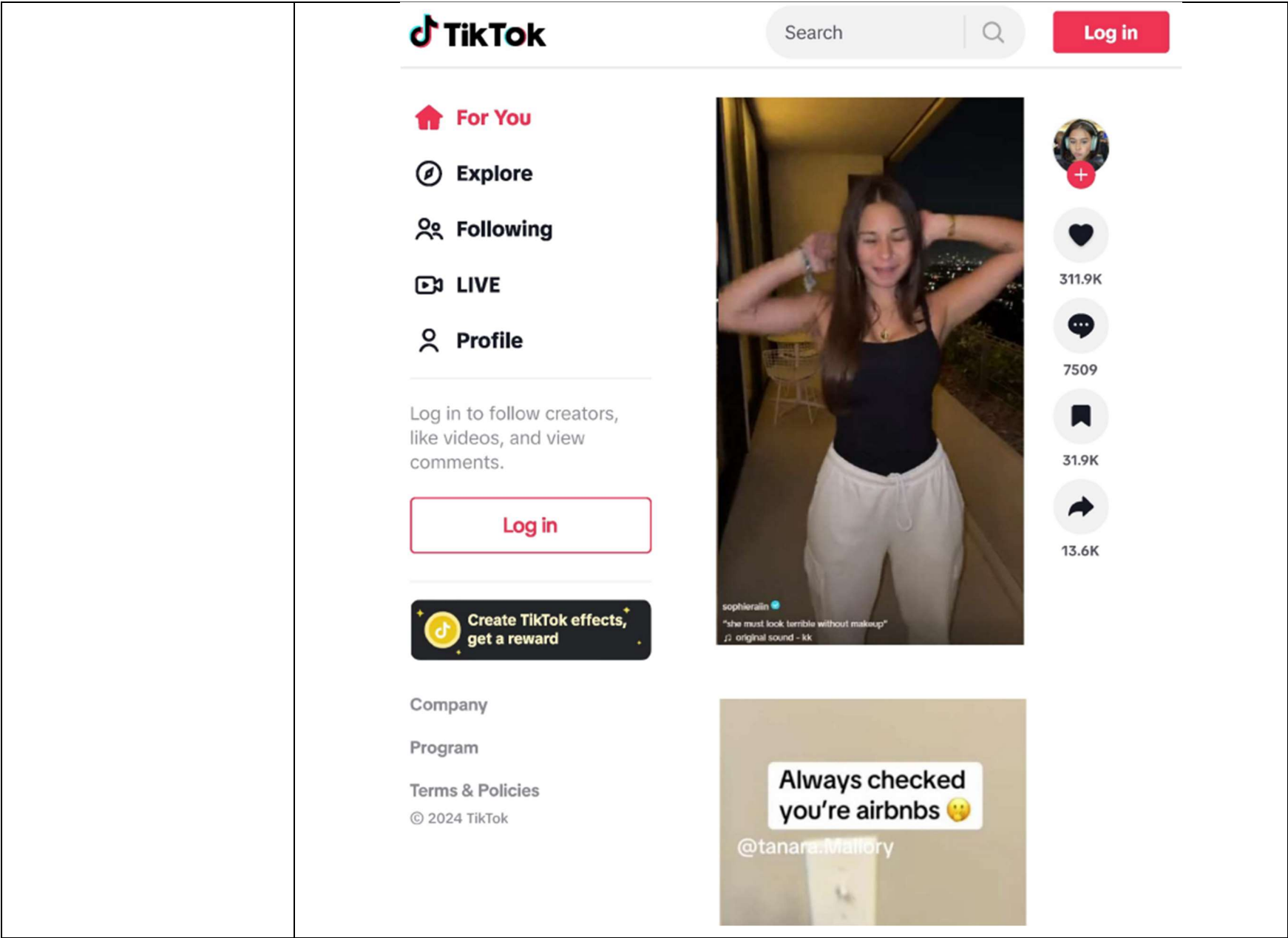
TikTok/Business Insider

NTECH 002205, 2207 (showing TikTok’s “For You” feed and “Following” feed composed of a predetermined sequence of content, displayed on the TikTok App on a mobile phone)

As depicted by the excerpts below, the Accused Instrumentalities will take different videos and concatenate them together into a media feed, in a predetermined sequence of content.



	NTECH 002274 (showing the results of a search, consisting of a predetermined and concatenated sequence of content, displayed on the TikTok App on a mobile phone)
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NTECH 002631-NTECH 002632 (Showing TikTok’s “For You” feed composed of a predetermined and concatenated sequence of content, within the TikTok Website, displayed on a computer)

-  **For You**
-  **Explore** New
-  **Following**
-  **LIVE**
-  **Profile**

Log in to follow creators,
like videos, and view
comments.

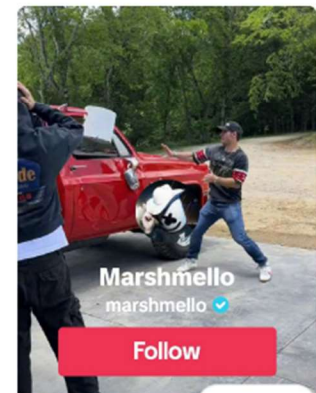
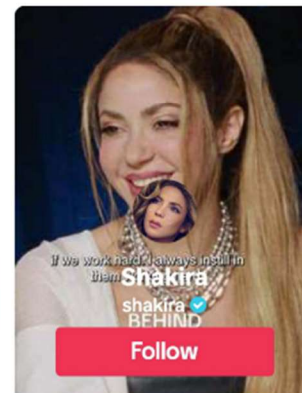
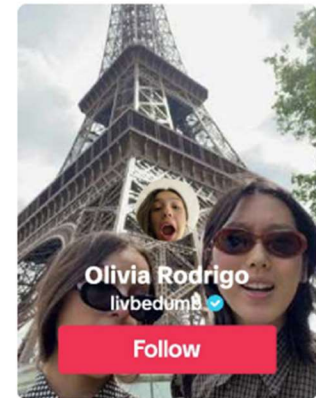
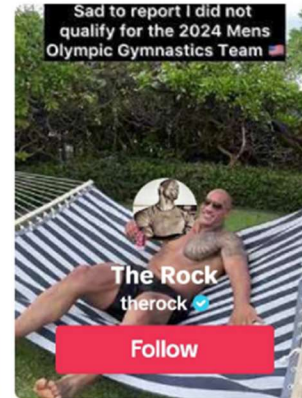
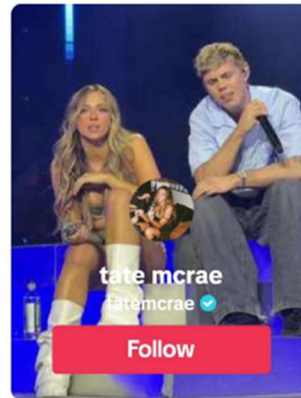
[Log in](#)

 **Create TikTok effects,
get a reward**

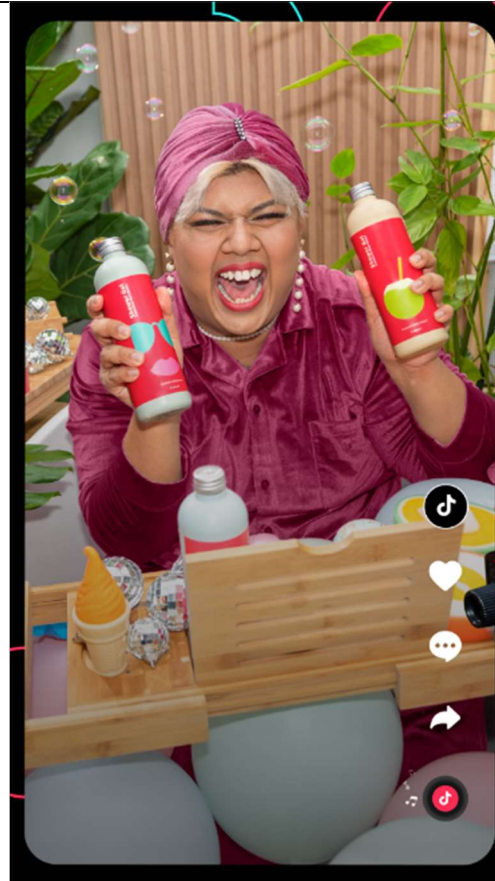
[Company](#)

[Program](#)

[Terms & Policies](#)



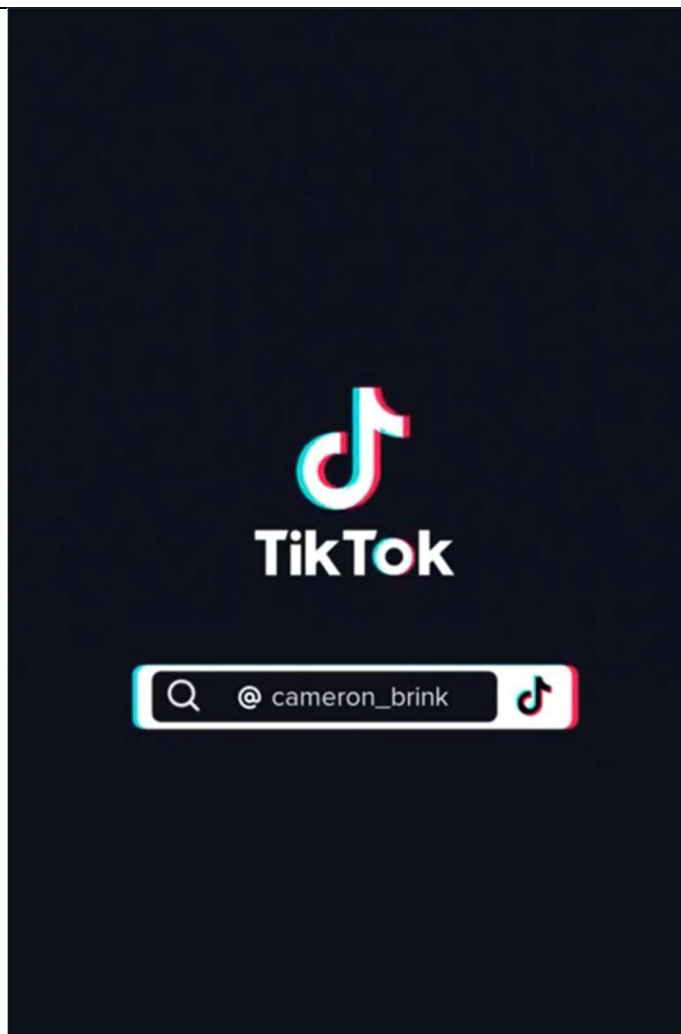
NTECH 002301-NTECH 002306 (Showing TikTok’s “Following” feed composed of a predetermined and concatenated sequence of content, within the TikTok Website, displayed on a computer)



NTECH 002564-2567 (Showing TikTok for Business webpage, showing an advertisement displayed on the TikTok App)

Further, the TikTok logo and sound is concatenated into the end of video clips, as depicted below.



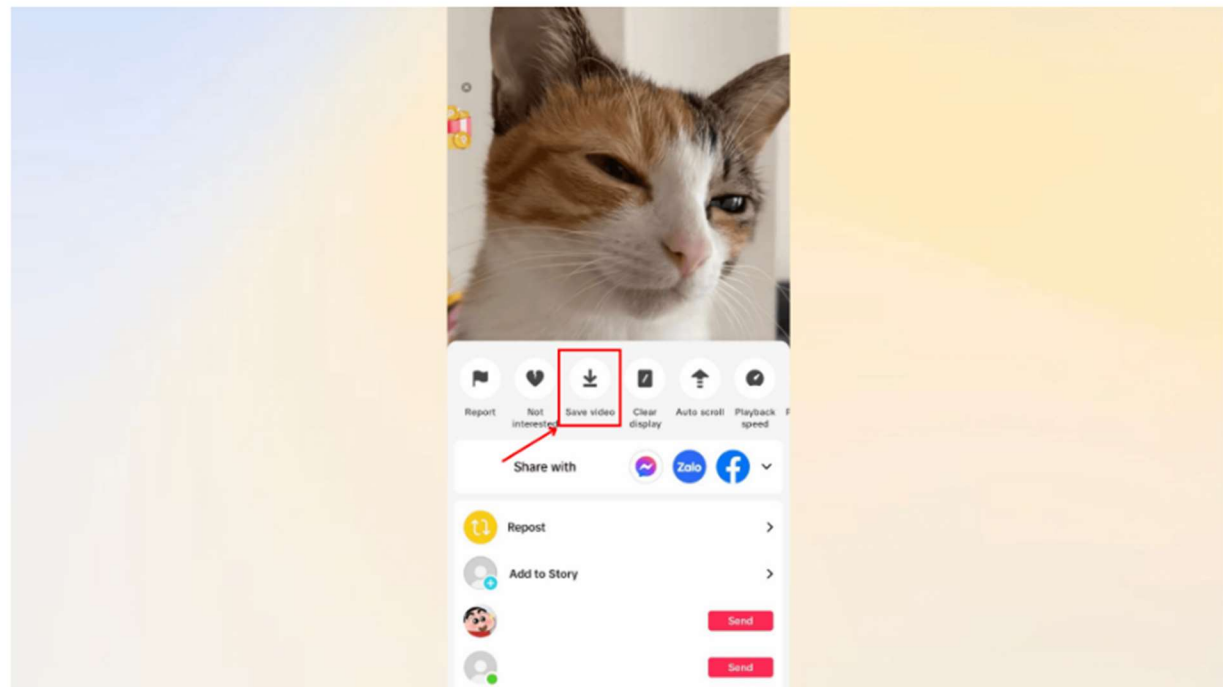


NTECH 002669 and NTECH 002667 (Showing the TikTok logo and sounds concatenated at the end of a video clip)

Further the Accused Instrumentalities concatenate two or more video clips in a process called a “Stitch”. A “Stitch” is a TikTok creative feature that allows videos from various TikTok creators to be

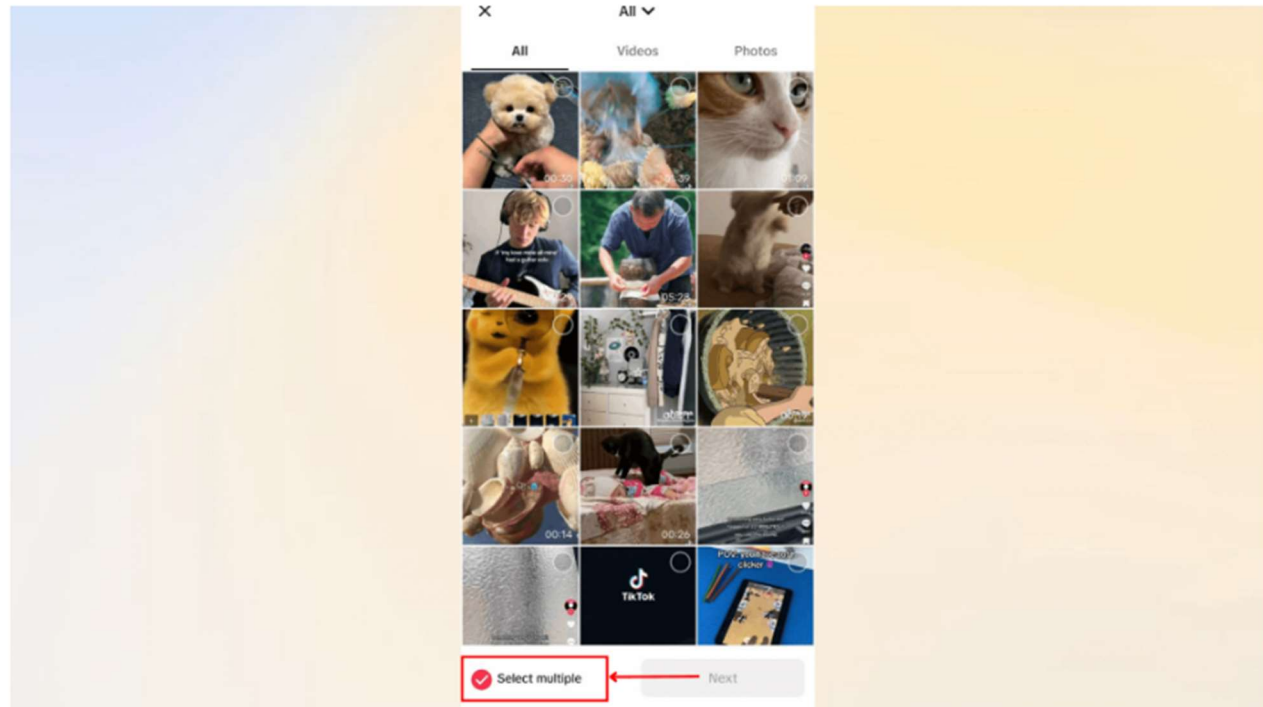
concatenated into other video clips, by editing and trimming parts of these video clip. A first trimmed video clip is edited to incorporate a second video clip at the end, to form one new and concatenated video clip, as depicted below.

Step 1. Download the TikTok video you want to stitch.



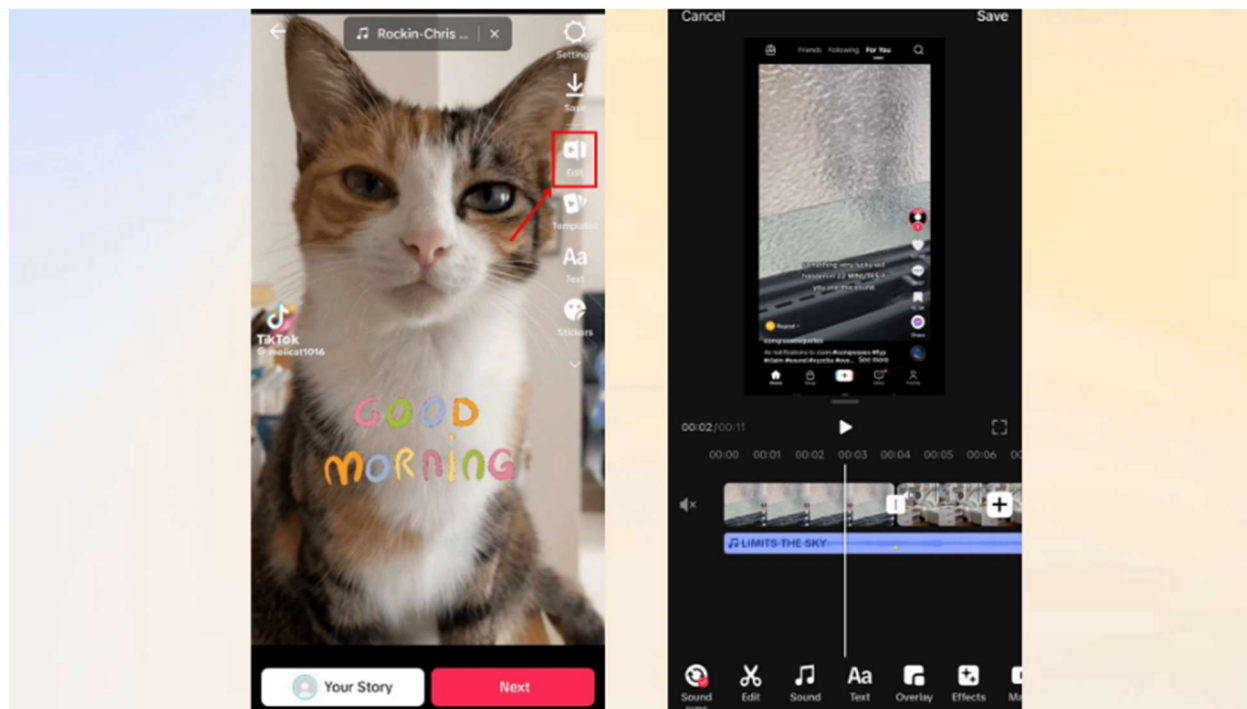
NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

Step 2. Open the TikTok app and hit the (+) button to create a new video. Tick Select multiple then choose the video you'd like to Stitch and the video you want to incorporate with it.



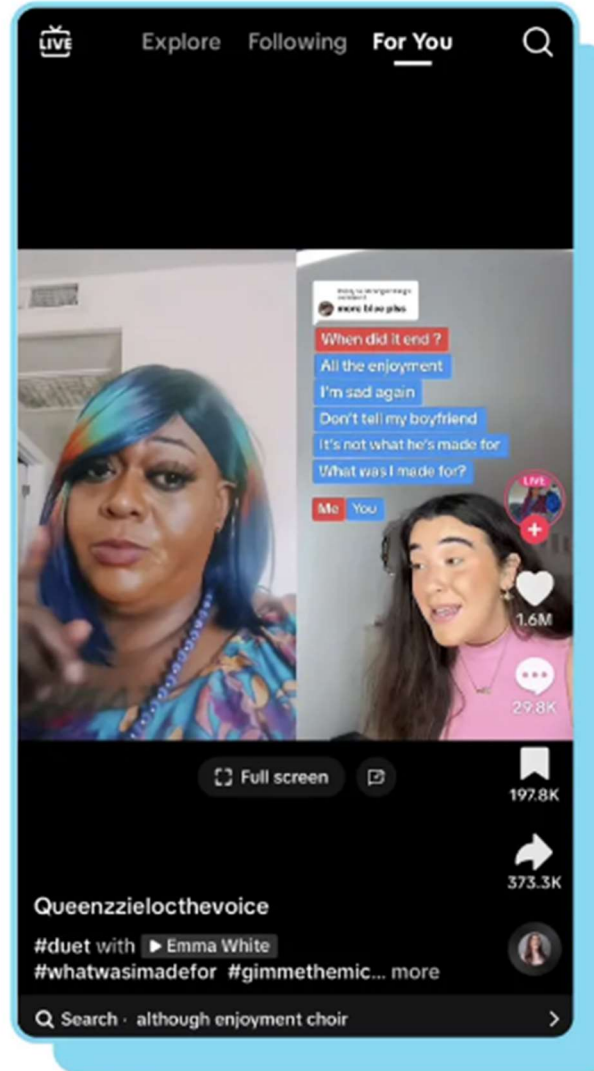
NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

Step 3. Click Edit from the right menu bar and trim the video you want to stitch video to 5s. When you are done editing, tap Save then Next to upload your video. Tag the creator of the initial video.



NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

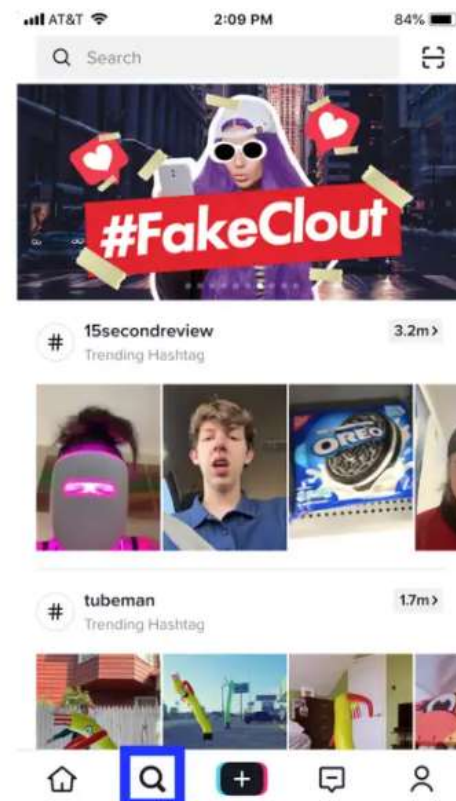
Further the Accused Instrumentalities concatenate two or more video clips in a process called a “Duet”. A “Duet” is a TikTok creative feature that allows videos from various TikTok creators to be concatenated into other video clips, by editing parts of these video clip. A first video clip is edited to incorporate a second video clip beside the first video clip. This forms one new and concatenated video clip, in which both video clips are displayed side by side, as depicted below.



NTECH 002652 – NTECH 002666 (Showing concatenated TikTok video by a TikTok “Duet”)

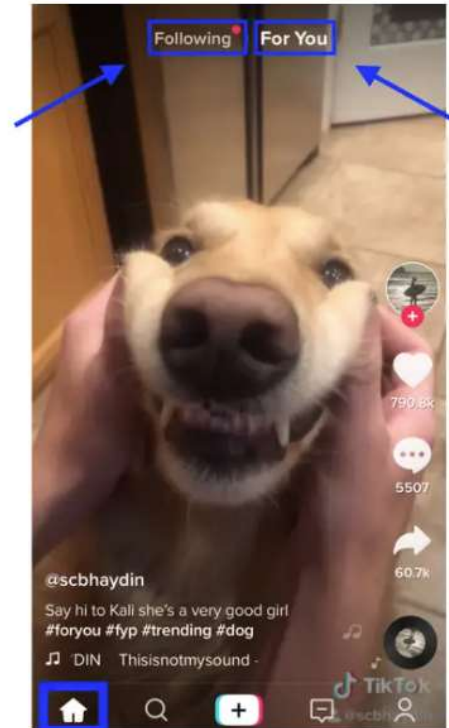
	To the extent that TikTok argues that the claim element is not met literally, the Accused Instrumentalities also infringe under the doctrine of equivalents. The Accused Instrumentalities perform the element in substantially the same functionality of providing media programming comprising a first media stream with concatenated elements of second and third media streams with concatenated elements from a plurality of media streams by linking and/or merging clips in the feed display (as shown in the “For You” feed), advertisements, Stitch functionality, Duets functionality, or with adding the TikTok logo and sound clip. The Accused Instrumentalities perform the element in substantially the same way because TikTok servers will link or merge clips by selecting which clips proceeds based, in part, on user selection. The Accused Instrumentalities achieve the same result by linking or merging the clips.
'704 Patent Claim 23	
23a. A system for providing media programming, comprising:	The Accused Instrumentalities generate media programming including video, audio, music, images and advertisement. This content can be generated on TikTok Servers, the TikTok Website, or the TikTok App. The content is displayed on the client used by the customer, including on the TikTok App or through the TikTok Website. The below excerpts depict different examples for how the Accused Instrumentalities display different content and displays this content to a user through a client.

The second tab in the menu running across the bottom of TikTok, represented by a magnifying glass, is where you'll find what's trending on the app. This is TikTok's bread and butter: it's where the latest viral trends are found, and associated hashtags are tracked.



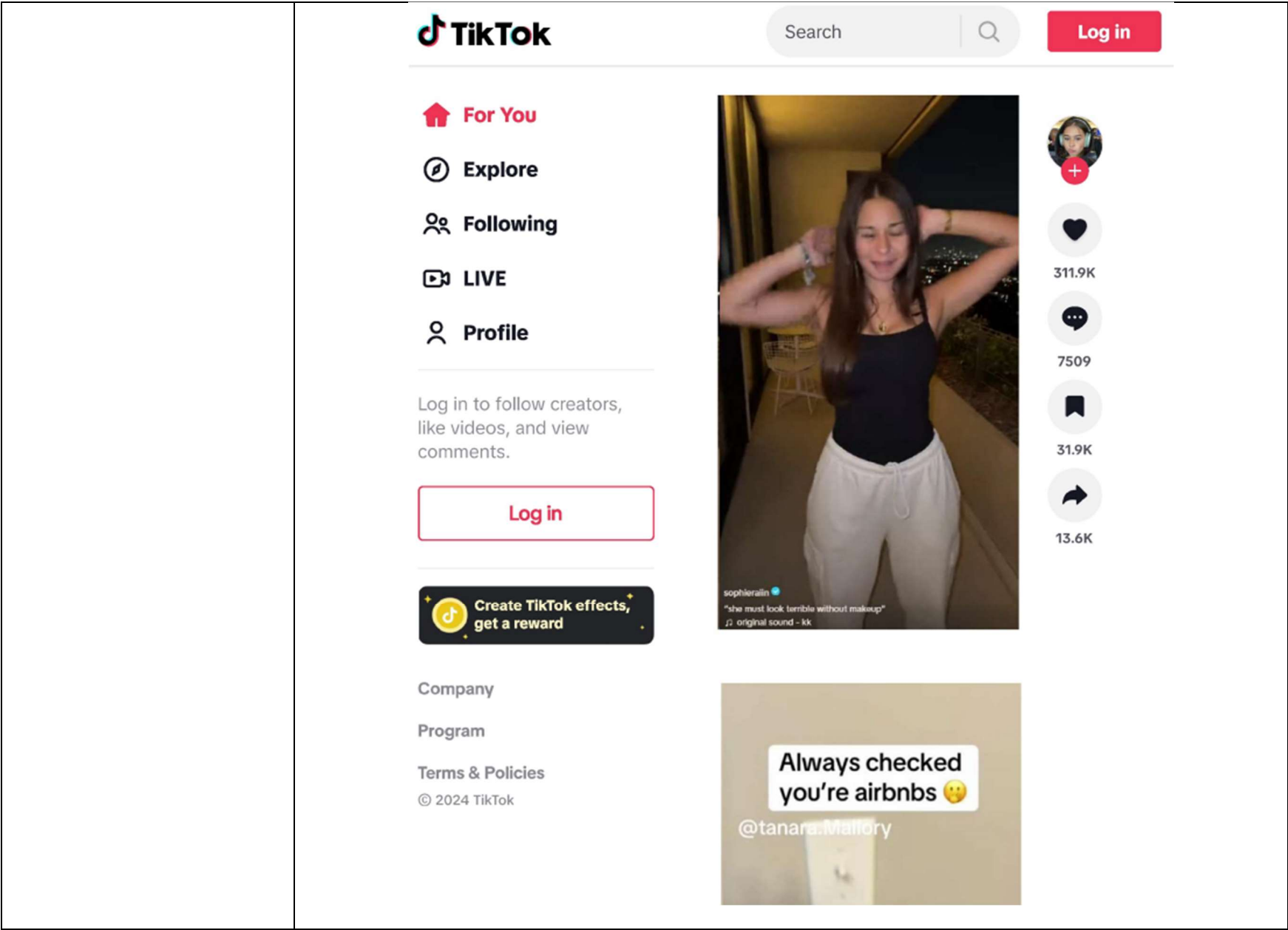
TikTok/Business Insider

The TikTok home page, where your feed lives, is split up into two sections: "following," to only see content from users you follow, and "for you," which amasses popular content from across TikTok, similar to Instagram's Explore page.

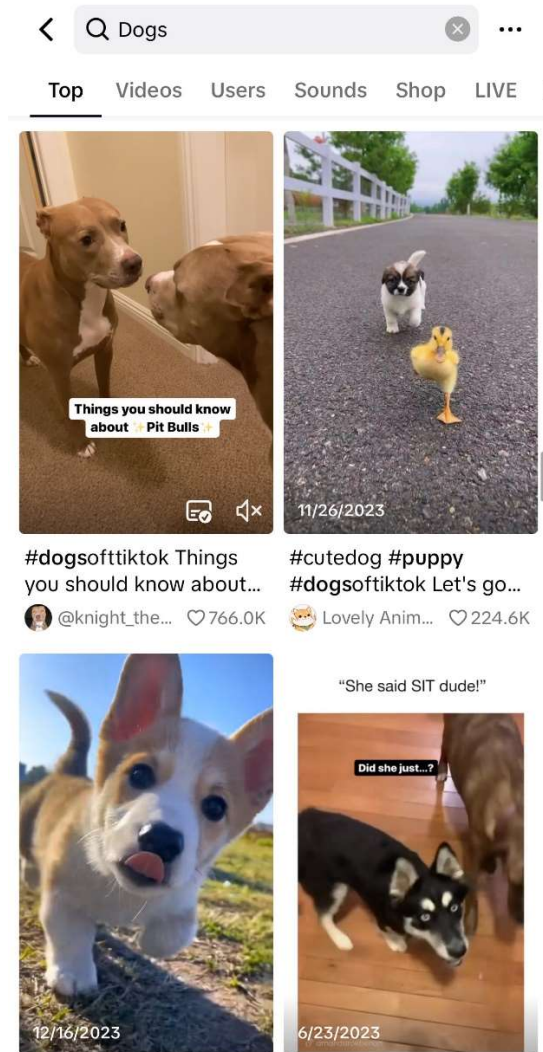


TikTok/Business Insider

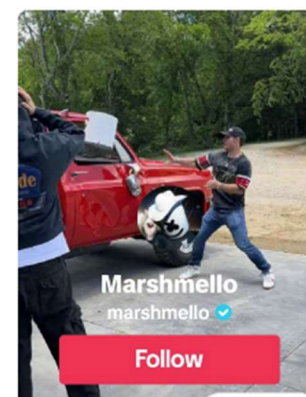
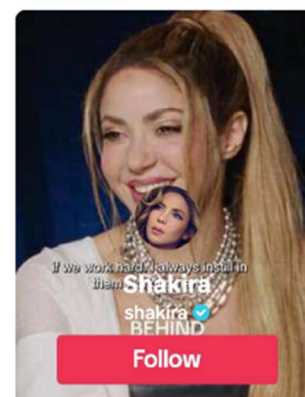
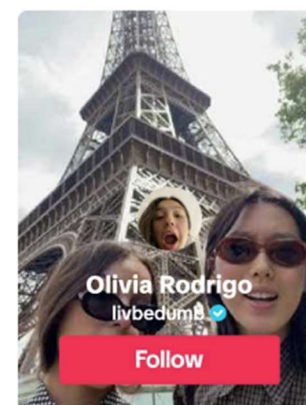
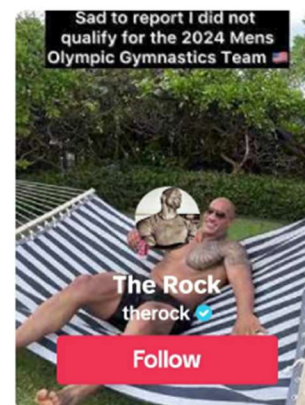
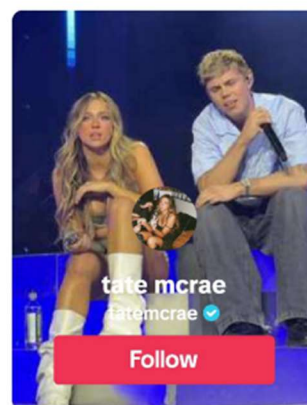
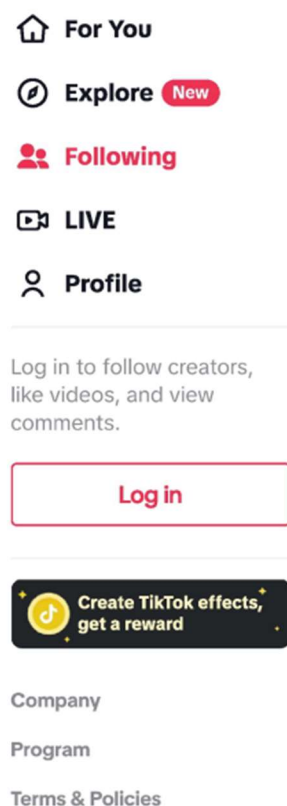
NTECH 002202 - NTECH 002225 at NTECH 002205, 2207 (showing media programming generated within the TikTok App and displayed on a mobile phone)



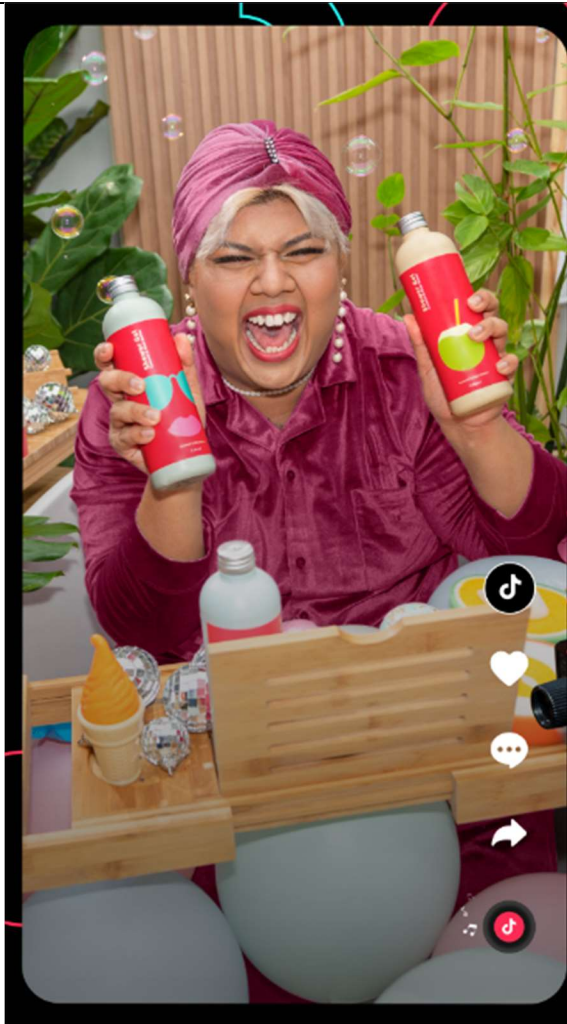
NTECH 002631-NTECH 002632 (Showing media programming generated within the “For You” feed on the TikTok Website and displayed on a computer)

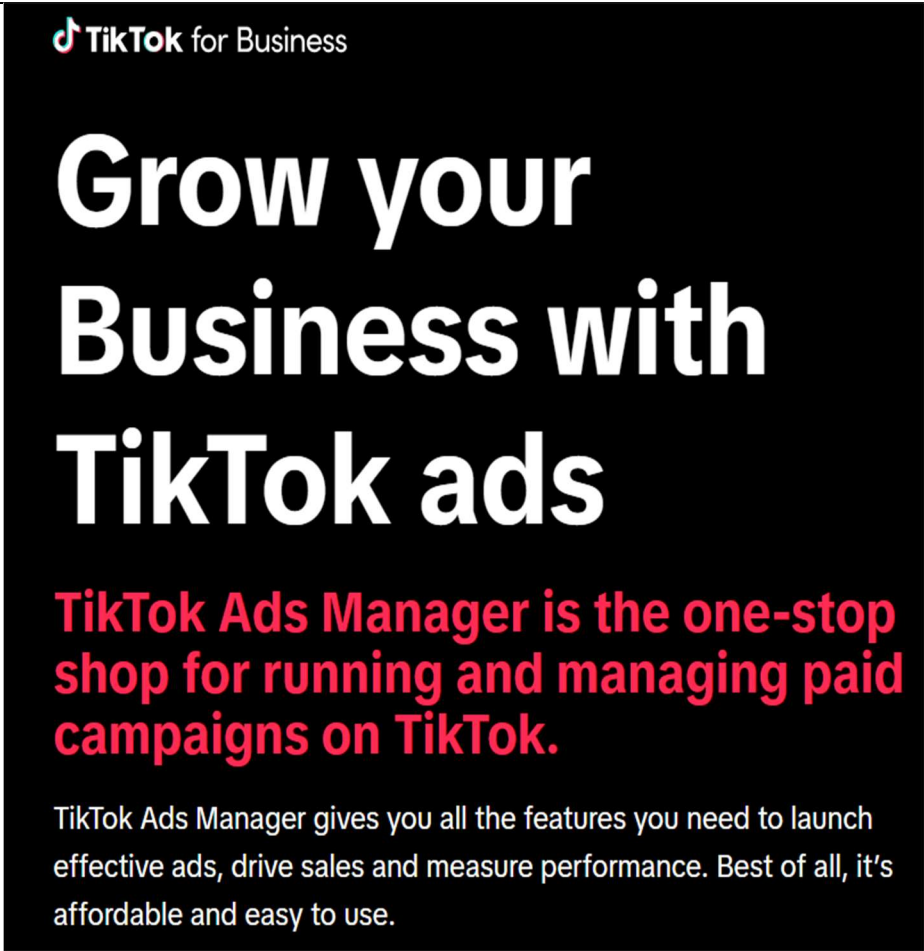


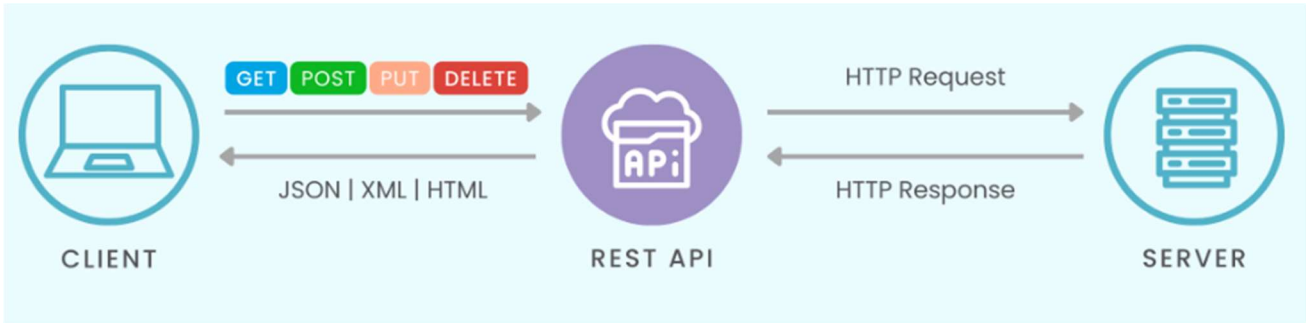
NTECH 002274 (showing media programming generated within TikTok’s search feed on a mobile phone)



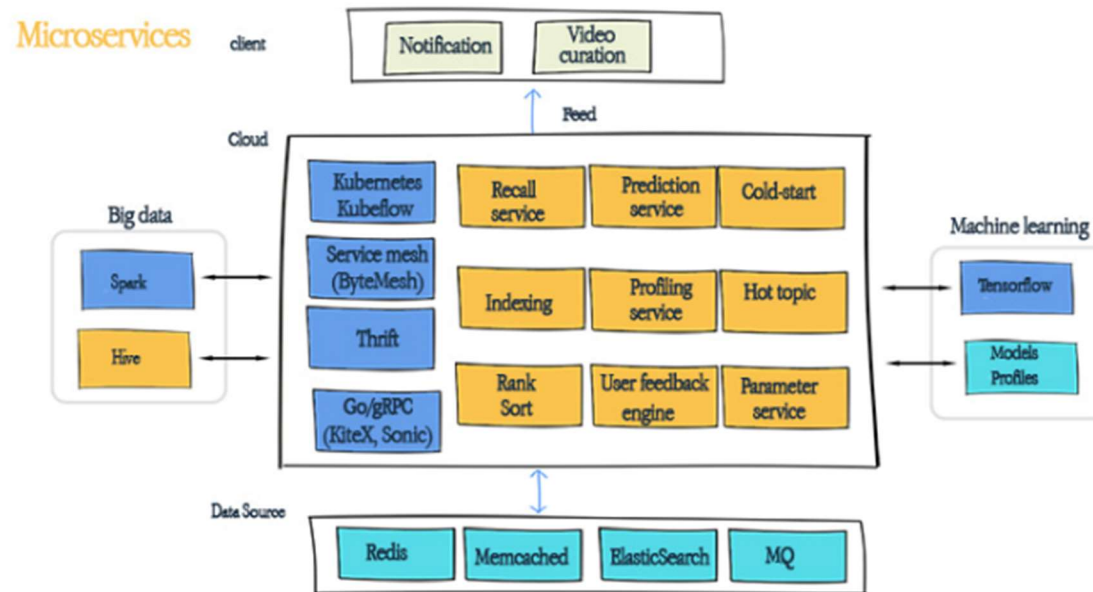
NTECH 002301-NTECH 002306 (Showing media programming generated within the “Following” feed on TikTok Website and displayed on a computer)



	 TikTok for Business Grow your Business with TikTok ads TikTok Ads Manager is the one-stop shop for running and managing paid campaigns on TikTok. TikTok Ads Manager gives you all the features you need to launch effective ads, drive sales and measure performance. Best of all, it's affordable and easy to use. NTECH 002564-2567 (Showing TikTok for Business webpage, providing directions on how to post and pay for advertisement on the Accused Instrumentalities) As described below, a user can watch content, such as TikTok video's, on a client through the TikTok App or the TikTok Website.
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	Watching TikTok videos In a nutshell, like videos from Vine or Instagram, TikTok videos appear vertically on your screen. You can engage with them using "hearts", which are the same as "likes." After you download the TikTok app and open it, you'll immediately see curated featured videos on the "for you" page. You can switch to the "following" page to see videos from users you follow - whether friends or popular TikTokkers. NTECH 002624- NTECH 002630 (https://www.pocket-lint.com/what-is-tiktok/ article explaining how TikTok is used)
23b. presenting to a user a list of media streams; receiving an input signal having data indicative of a selection of one of the media streams feeds from the list;	The Accused Instrumentalities operate aggregators. TikTok's aggregators are TikTok's servers powering its recommendation engine i.e frontend servers and backend servers or a combination of both (TikTok's frontend and backend server include TikTok's web servers, application servers and database servers). As depicted below, a user selects from a list of media streams. This selection is turned into an input signal when data packets and webpage information (in a JSON format or a HTML format) are transferred between TikTok's webservers, the TikTok Application and the TikTok Webpage over a signal, which is an internet network facilitated by API's.  <pre> graph LR Client[CLIENT] -- "GET POST PUT DELETE" --> API[REST API] API -- "JSON XML HTML" --> Client API -- "HTTP Request" --> Server[SERVER] Server -- "HTTP Response" --> API </pre>

NTECH 002711 – NTECH 002719 (<https://www.skiplevel.co/blog/part-2-rest-api-components-how-to-read-them> Graphic showing the transfer of user selection data and information from a client device to a server and the reverse)

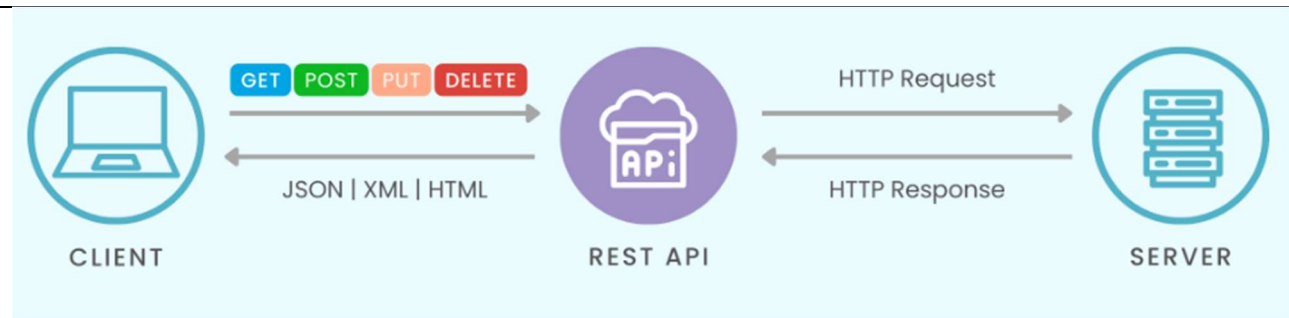


NTECH 002605 - NTECH 002615 at NTECH 002610 Graphic showing TikTok’s microservices including Sonic, an enhanced JSON library)

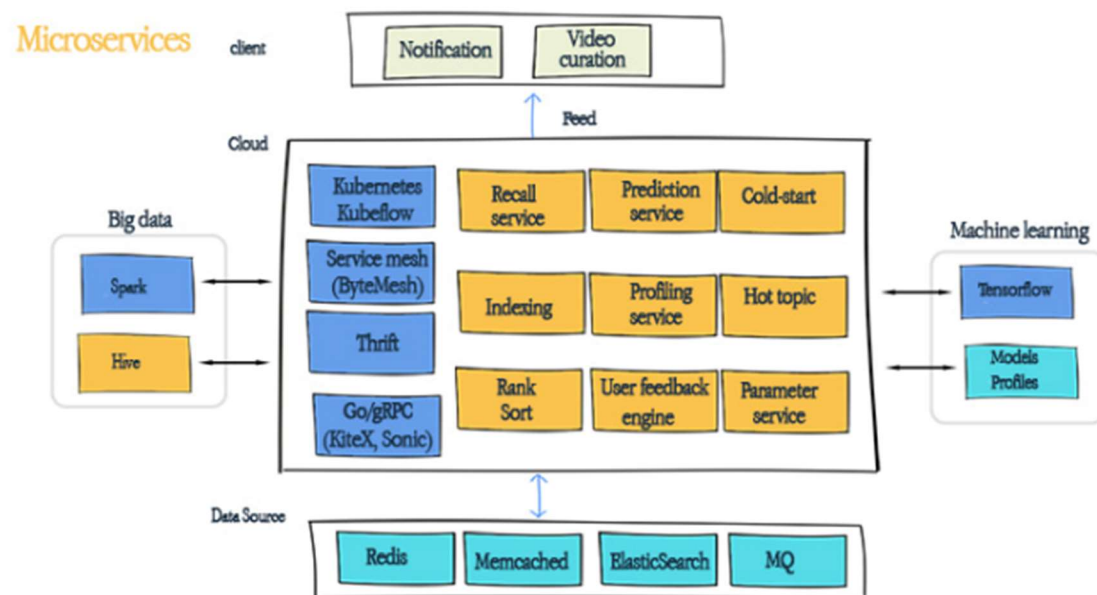
23c. providing an output signal having data indicative of the selection;

The aggregator of the accused instrumentalities, (which are a combination of TikTok servers) receive user selections. This selection is transferred from a client device, by API’s, to its web servers which in turn provide an output signal including data indicative of the selection and of user data

As depicted below, when a user makes a selection requesting media programming, such as a selecting the “For You” feed, this selection is turned into a JSON data packet which is provided to TikTok Servers as an output signal over the internet via a HTTP request.



NTECH 002711 – NTECH 002719 (<https://www.skiplevel.co/blog/part-2-rest-api-components-how-to-read-them> Graphic showing the process of a JSON request and response)



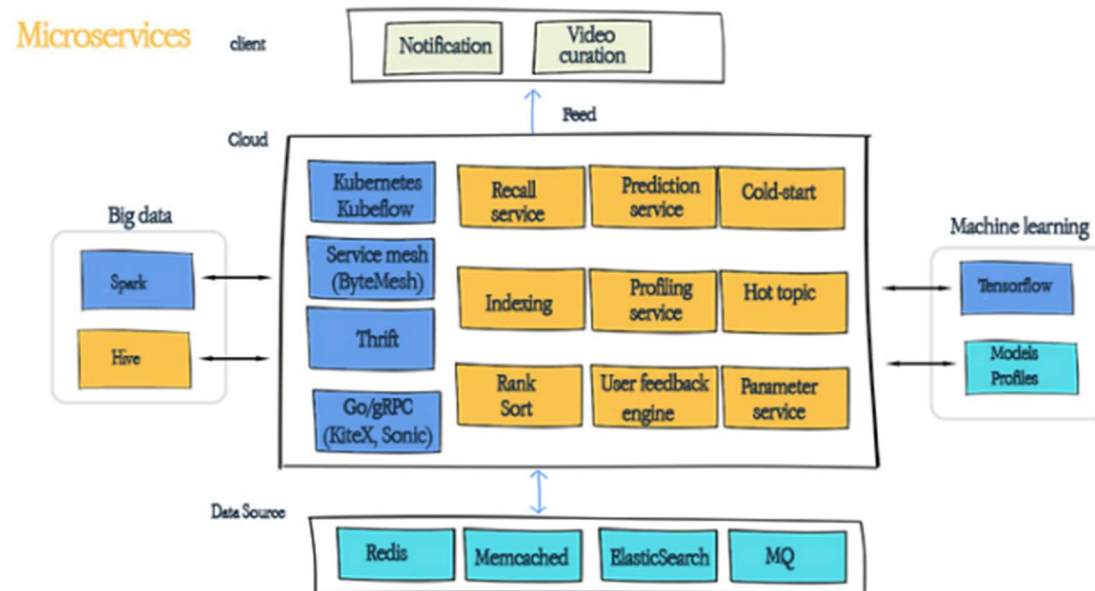
NTECH 002605 - NTECH 002615 at NTECH 002610 (Graphic showing TikTok's microservices including Sonic, an enhanced JSON library)

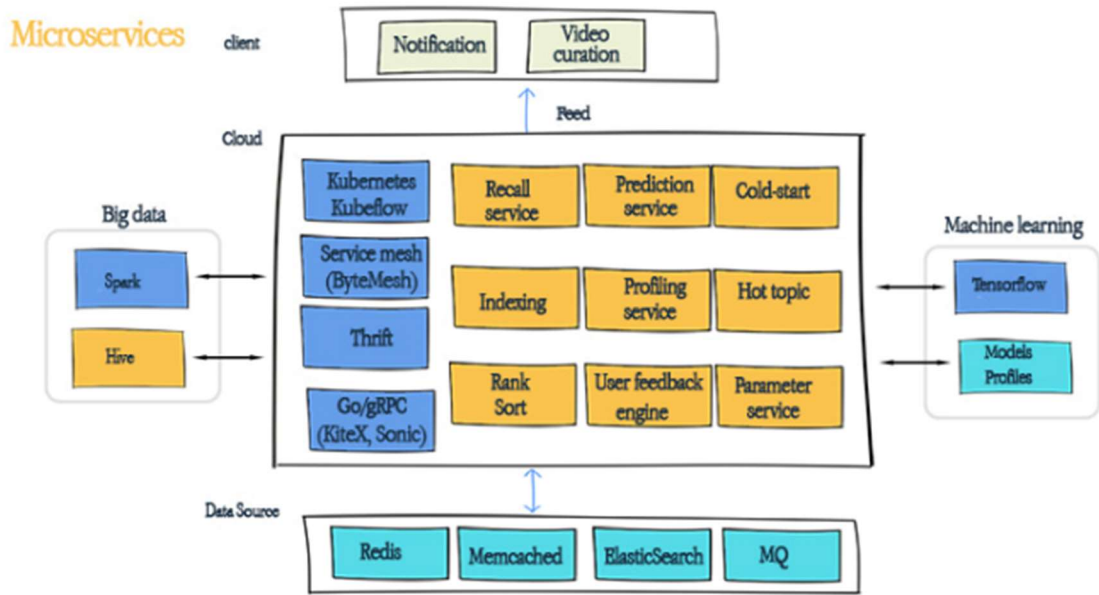
23d. receiving, responsive to the output signal, at least the selected media stream; and

TikTok servers receive data packet and obtain the requested media elements selected.



NTECH 002695 – NTECH 002710 (Graphic showing the process of a JSON request and response)



	NTECH 002605 - NTECH 002615 at NTECH 002610 (Graphic showing TikTok’s microservices including Sonic, an enhanced JSON library)
23e. responsive to the data indicative of the selection and user information, and using at least one algorithm for selection and sequencing of media elements, selecting a temporal sequence of media programming comprising the selected media stream and other media elements, and providing media programming to the user, the media programming comprising the other media elements selected and concatenated in accordance with the temporal sequence with the selected media stream.	TikTok Servers receive requested data packets (in a JSON format) and simultaneously communicate with various TikTok microservices which host the TikTok algorithm. As depicted below, TikTok’s algorithms use its microservices (Kubeflow, Kubernetes, KFServing etc.) to select and create a temporal sequence of media elements which creates media programming. This media programming is delivered to a user’s client device.  NTECH 002605 - NTECH 002615 at NTECH 002610 (Graphic showing TikTok’s microservices including Kubernetes and KubeFlow) As shown below, the Accused Instrumentalities will use an algorithm to determine the sequence and selection of media elements to create media programming to present to the user and will present a unique media stream in their “For You” feed and “Following” feed. The Accused Instrumentalities use

user data to determine each individual piece of content, including advertisement, that will be recommended to a user, as shown below.

Why a video is recommended on your For You feed

At TikTok, we want to help you understand why certain videos appear on your For You feed. That's why we share this information on each video in the feed.

To learn why a video is recommended to you:

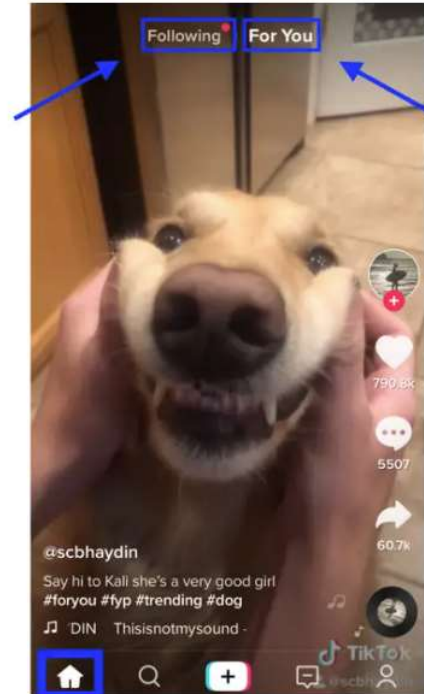
1. In the TikTok app, tap the **Share** button on the side of a video in the **For You** feed.
2. Tap **Why this video**. We'll list some reasons why a video shows up on your feed, such as:
 - You commented on, liked, shared, or watched similar videos
 - This video is popular in your country
 - This video was posted recently
 - This video is longer, and you seem to like longer videos
 - You're following this creator

Keep in mind, if you've recently [refreshed your For You feed](#), you'll see a variety of videos while we learn your preferences to launch your new personalized feed.

NTECH 002226 - NTECH 002231 (Showing how TikTok interprets user action to recommend content)

	How We Use Your Information As explained below, we use your information to improve, support and administer the Platform, to allow you to use its functionalities, and to fulfill and enforce our Terms of Service. We may also use your information to, among other things, show you suggestions, promote the Platform, and customize your ad experience. We generally use the Information We Collect → : • To fulfill requests for products, services, Platform functionality, support and information for internal operations, including troubleshooting, data analysis, testing, research, statistical, and survey purposes and to solicit your feedback. • To customize the content you see when you use the Platform. For example, we may provide you with services based on the country settings you have chosen or show you content that is similar to content that you have liked or interacted with. • To send promotional materials from us or on behalf of our affiliates and trusted third parties. • To improve and develop our Platform and conduct product development. • To measure and understand the effectiveness of the advertisements we serve to you and others and to deliver advertising, including targeted advertising, to you on the Platform. • To make suggestions and provide a customized ad experience. NTECH 002449 - NTECH 002467 (TikTok help center article stating how user information is utilized, including to customize content displayed on the TikTok App and the TikTok Website) As depicted by the excerpt below, the Accused Instrumentalities will generate various media streams, including the “For You” and “Following” feeds. Each concatenated to display media programming or content, connected to each other to produce a chain of media programming.
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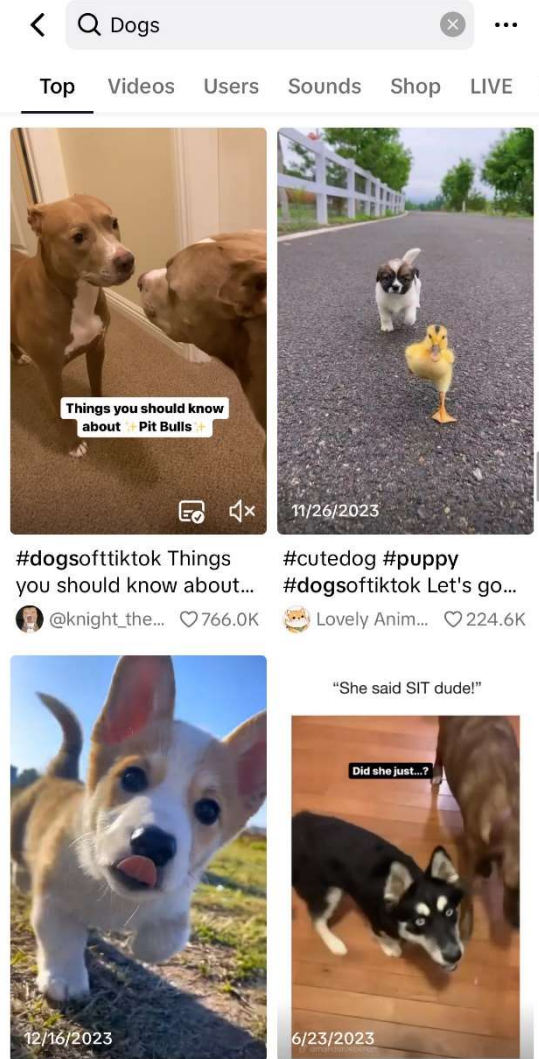
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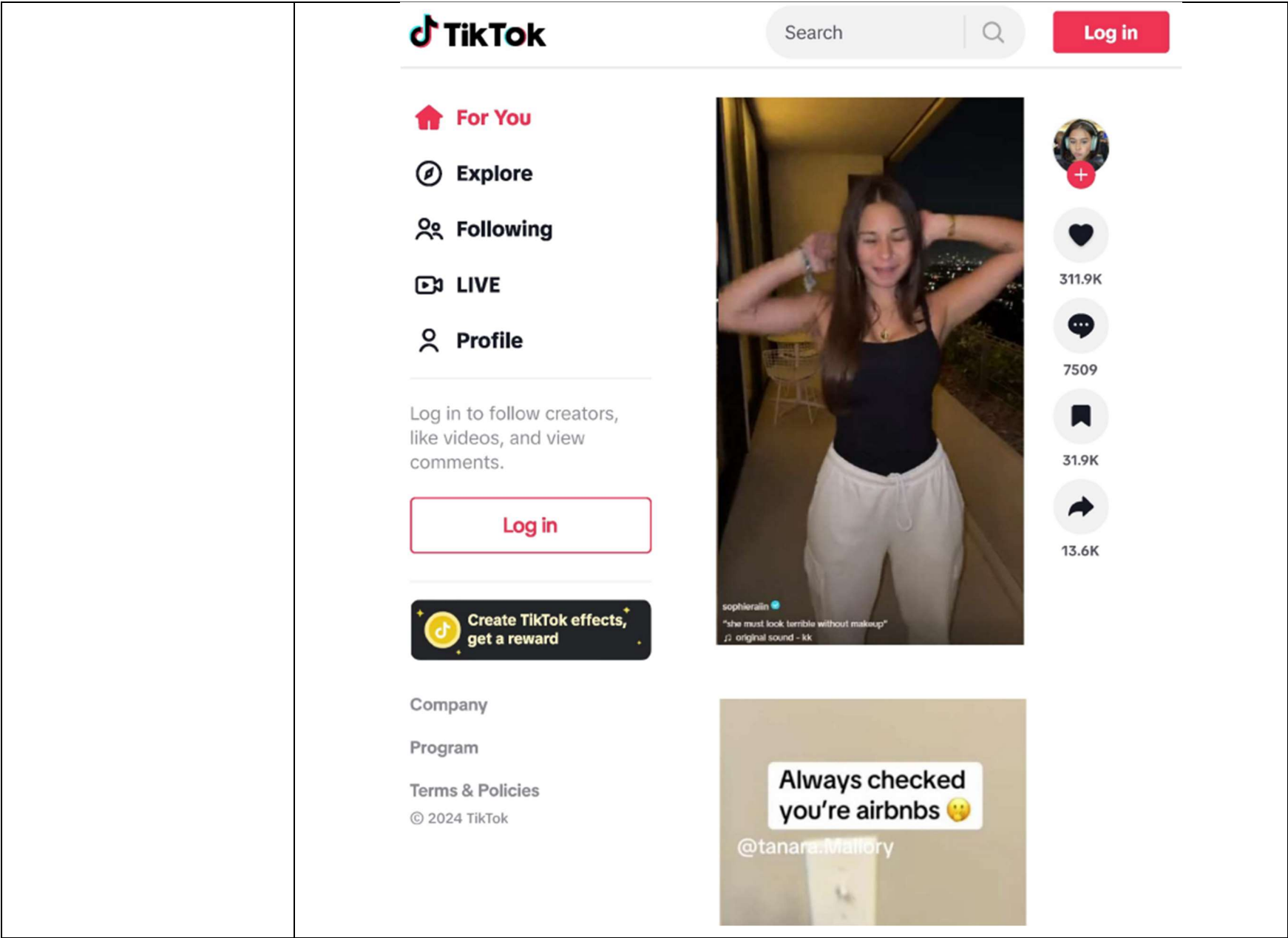
TikTok/Business Insider

NTECH 002205, 2207 (Showing TikTok's "For You" feed and "Following" feed composed of a predetermined sequence of content, displayed on the TikTok App on a mobile phone)

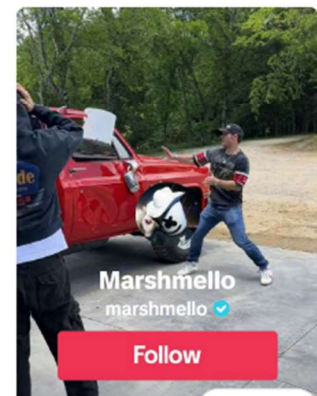
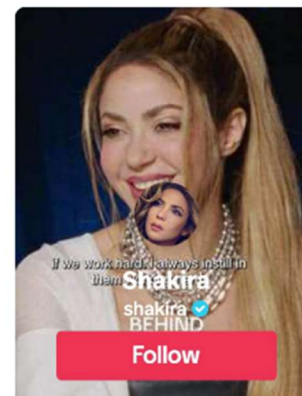
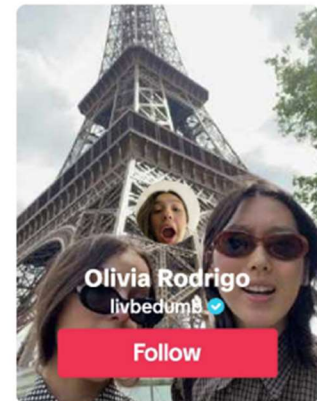
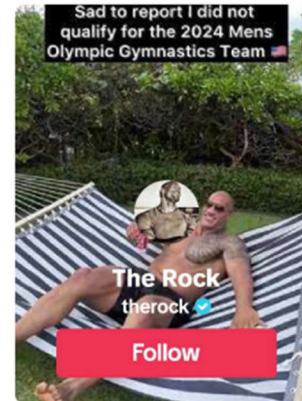
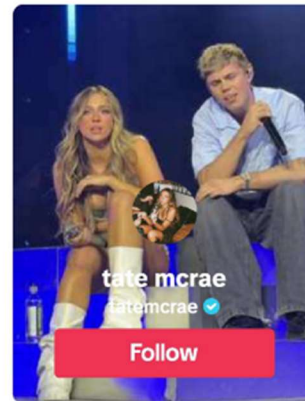
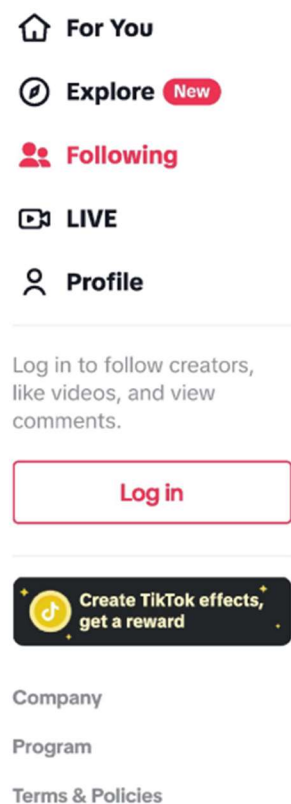
As depicted by the excerpts below, the Accused Instrumentalities will take different videos and concatenate them together into a media feed, in a predetermined sequence of content.



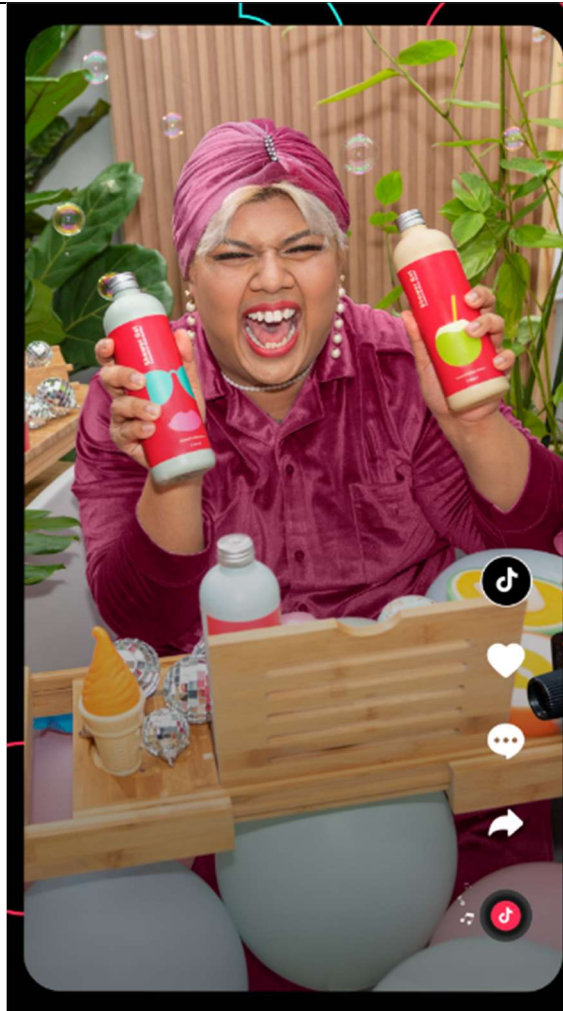
NTECH 002274 (showing the results of a search, consisting of a predetermined and concatenated sequence of content, displayed on the TikTok App on a mobile phone)



NTECH 002631-NTECH 002632 (Showing TikTok’s “For You” feed composed of a predetermined and concatenated sequence of content, within the TikTok Website, displayed on a computer)



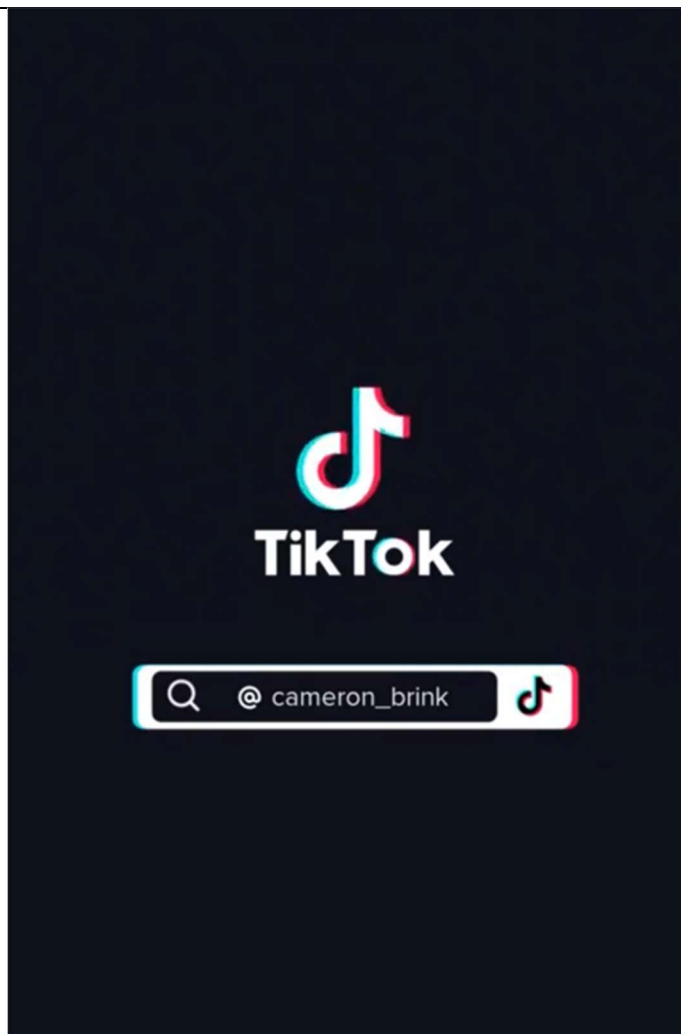
NTECH 002301-NTECH 002306 (Showing TikTok’s “Following” feed composed of a predetermined and concatenated sequence of content, within the TikTok Website, displayed on a computer)



NTECH 002564-2567 (Showing TikTok for Business webpage, showing an advertisement displayed on the TikTok App)

Further, the TikTok logo and sound is concatenated into the end of video clips, as depicted below.



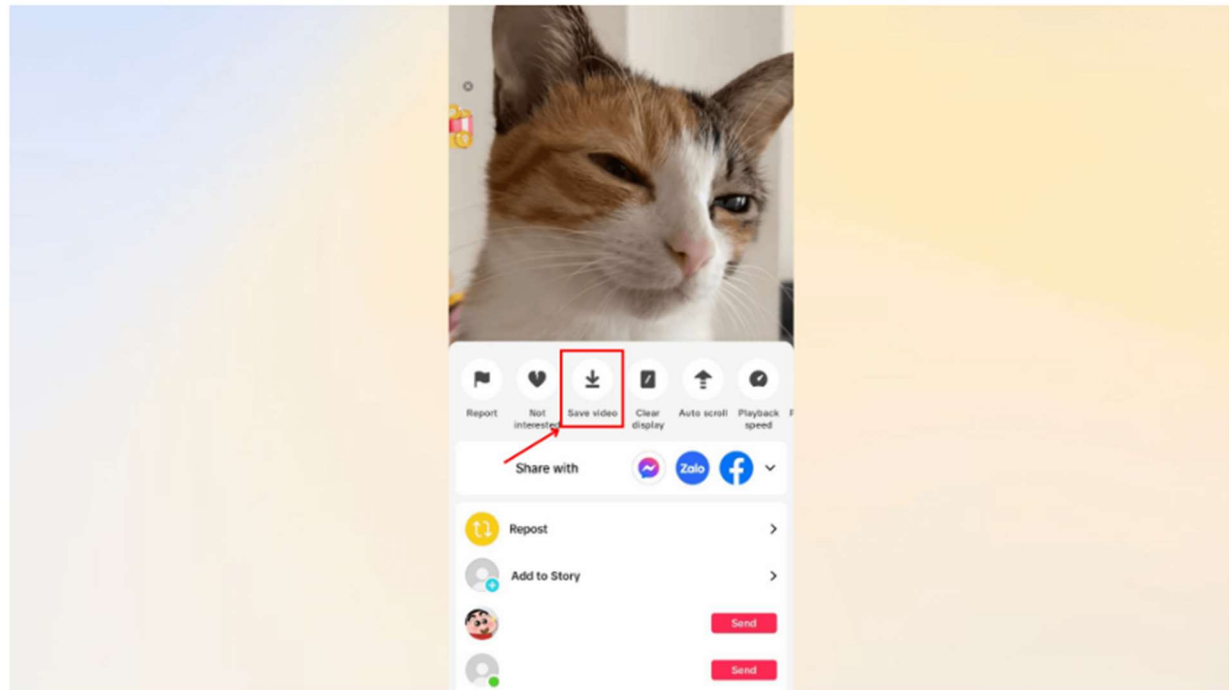


NTECH 002669 and NTECH 002667 (Showing the TikTok logo and sounds concatenated at the end of a video clip)

Further the Accused Instrumentalities concatenate two or more video clips in a process called a “Stitch”. A “Stitch” is a TikTok creative feature that allows videos from various TikTok creators to be

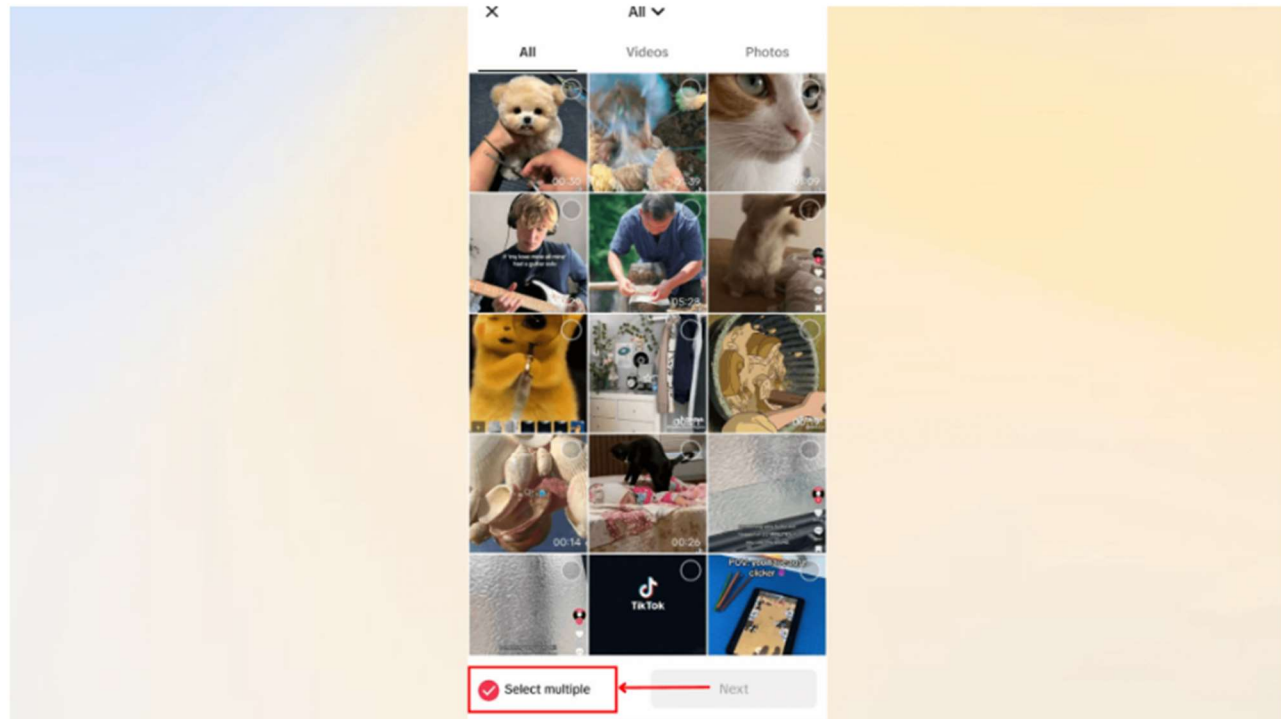
concatenated into other video clips, by editing and trimming parts of these video clip. A first trimmed video clip is edited to incorporate a second video clip at the end, to form one new and concatenated video clip, as depicted below.

Step 1. Download the TikTok video you want to stitch.



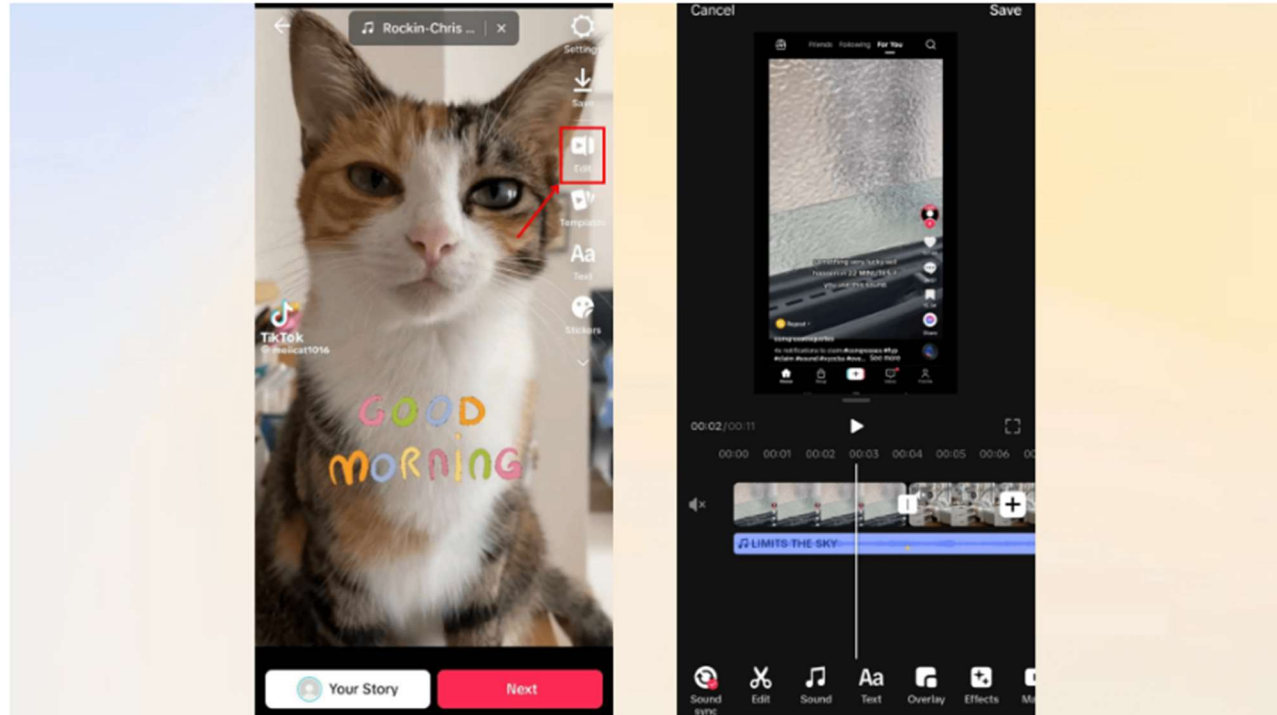
NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

Step 2. Open the TikTok app and hit the (+) button to create a new video. Tick **Select multiple** then choose the video you'd like to Stitch and the video you want to incorporate with it.



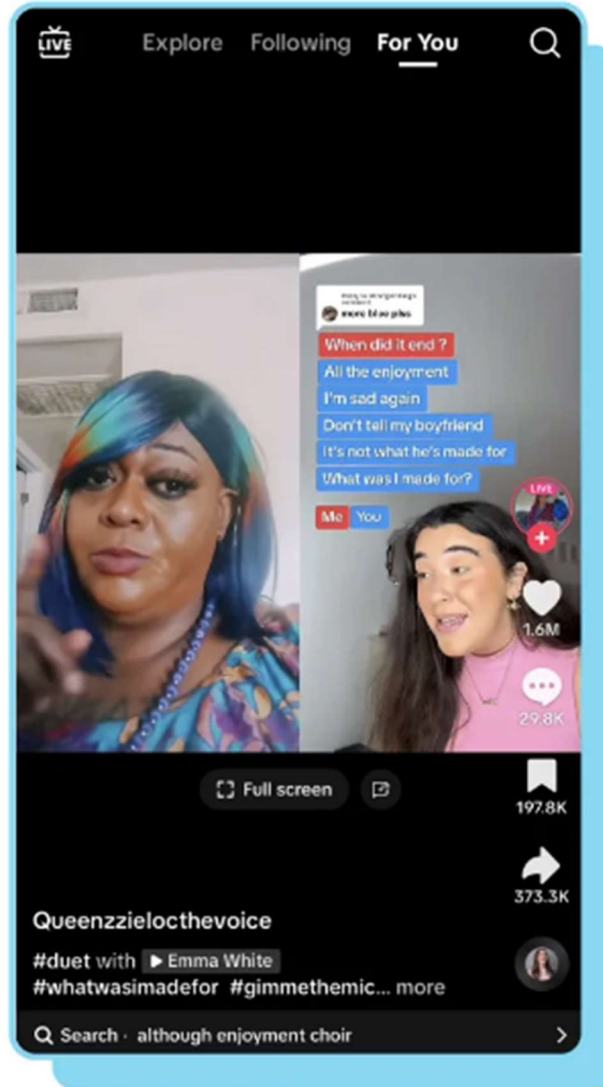
NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

Step 3. Click Edit from the right menu bar and trim the video you want to stitch video to 5s. When you are done editing, tap Save then Next to upload your video. Tag the creator of the initial video.



NTECH 002671 – NTECH 002694 (Showing the process of concatenating TikTok videos by a TikTok “Stitch”)

Further the Accused Instrumentalities concatenate two or more video clips in a process called a “Duet”. A “Duet” is a TikTok creative feature that allows videos from various TikTok creators to be concatenated into other video clips, by editing parts of these video clip. A first video clip is edited to incorporate a second video clip beside the first video clip. This forms one new and concatenated video clip, in which both video clips are displayed side by side, as depicted below.



NTECH 002652 – NTECH 002666 (Showing concatenated TikTok video by a TikTok “Duet”)

	To the extent that TikTok argues that the claim element is not met literally, the Accused Instrumentalities also infringe under the doctrine of equivalents. The Accused Instrumentalities perform the element in substantially the same functionality of providing a media programming comprising a temporal sequence of media programming with concatenated elements from a selected media streams by linking and/or merging clips in the feed display (as shown in the “For You” feed), advertisements, Stitch functionality, Duets functionality, or with adding the TikTok logo and sound clip. The Accused Instrumentalities perform the element in substantially the same way because TikTok servers will link or merge clips in a temporal fashion by selecting which clips proceed will proceed in time. The Accused Instrumentalities achieve the same result by linking or merging the clips.
'704 Patent Claim 24	
24. The method of claim 23, further comprising receiving a second media stream, and wherein the step of providing so media programming comprises switching at least between the selected media stream and the second media stream in accordance with the temporal sequence.	See claim 23.