

ArcGIS API for JavaScript

Esri development team members Jeremy Bartley and Kelly Hutchins explain and demonstrate ArcGIS API for JavaScript.

<http://video.esri.com/watch/153/arcgis-api-for-javascript>

Video Transcription

00:01 Thanks for coming.

00:03 I'm Jeremy Bartley and I'm pleased to be joined with Kelly Hutchins here.

00:07 We both work on the JavaScript API dev team.

00:11 My background's in geography, and that's your background, too, right Kelly?

00:16 Yep. We're both geographers but we kind of found our way into the exciting world of computer mapping.

00:23 And, it is a great time to be integrating maps for building applications that have maps or a map driven or a map focused...

00:33 ...for your end users.

00:34 It's much better than it was, I don't know, 5 or 10 years ago...

00:38 ...when a lot of the mapping applications you would see were really hard to use...

00:42 ...and only a geographer who was versed in whatever technology could actually run the maps or the apps.

00:50 Now it's totally different, and that's why it's exciting and it helps reach the consumer world, not just the professional world.

00:58 So I'm going to...I have no slides.

01:01 I have a bunch and bunch of demos that I'm going to drill through and show you kind of what you can do.

01:07 Won't drill into too much code, but everything that...just about everything that I show you is already online...

01:12 ...and you can always refer back to it.

01:16 So our JavaScript API, we're currently on version 2.1.

01:18 We released...we've had nine releases of our JavaScript API, released relatively quickly over the last two years.

01:26 Next release in December will be 2.2 which will be our templates.

01:30 We're really excited about that.

01:33 But everything is online.

01:34 Everything that you need is online.

01:36 We host the library online on a content delivery network so you get a fast download of our library.

01:43 And the SDK is also online.

01:47 You know, you can drill through each one of these sections...look at...

01:48 ...there's a whole bunch of conceptual documentation that help you get started using our API.

01:55 Also, a large set of samples...oops...large set of samples.

02:04 I mean, we must have over 125 different samples that you can try online.

02:08 We had so many samples and we had to introduce a search mechanism so you could drill through them.

02:13 We have a really rich API reference.

02:16 Lots of content is available from this API reference.

02:20 There's really great documentation, so if you're looking, if you're just getting started and want to know how something works...

02:26 ...I mean, just look at the documentation that's available for just one of these classes.

02:31 It's really outstanding.

02:32 Kelly does a great job.

02:35 And we also have a set of code assist plug-ins like, you know, a lot of...you can develop JavaScript applications in Notepad...

02:42 ...or Textpad or Notepad++, but that's a little bit more difficult than to use a nice IDE where you get code complete, and so on.

02:51 Optana has a really good JavaScript debugging experience.

02:54 It's freeware that you can download and just use.

02:59 And we have our whole API references available as a code assist plug-in.

03:03 So when you're doing your code assist, you'll get the actual doc as it is online...

03:08 ...you know, for each class that you create or each method that you want to call.

03:15 And then just something at the end.

03:17 We have a whole bunch of our users who have uploaded their applications and shared them on ArcGIS.com.

03:23 We've kind of given a window into the JavaScript application on this site.

03:30 You know, there's hundreds of these applications that people have built.

03:33 You can use them to kind of get ideas for what people do.

03:36 Like, this example is from The Omega Group, and 0892, go to my house hopefully.

03:56 There we go.

03:58 And see all of the crime that's happened over a particular time period.

04:03 This kind of the crime mapping is very popular and now there's open crime maps and so forth.

04:09 And you can do quite a bit with, you know, this is to get the people who are worried about what's going on...

04:14 ...around your neighborhood, what crimes are being committed.

04:16 You have access to all that information from this nice simple-to-use user interface.

04:23 This is an example of a consumer application.

04:26 I think if you were to see this app maybe 10 years ago, it would have looked nothing like this.

04:31 It would have been all jargon about various layers and turning things on and off...

04:34 ...and nobody but the person who builds it or the GIS professional who builds it would know how to use it.

04:40 So we've come a long way.

04:44 So if we drill into some of these samples and to show you how you really want to get started...

04:48 ...but we'll just take a look at the kind of hello world example.

04:52 And if we launch this, this example here.

04:54 This is just a very simple example about creating an application that has just a few components.

04:59 It's got a scale bar component and has a nice basemap layer.

05:02 This is that same community map that Dave was talking about in his session.

05:06 You see the nice trees for the City of San Francisco.

05:09 This is a great multiscale basemap that covers the whole world...

05:12 ...and there's organizations throughout the world who've submitted their data and is part of this kind of tapestry, this thematic map.

05:23 Oh, excuse me. I wanted to look at the code there just briefly.

05:33 Won't do too much looking at the source code, but just kind of give you a feel for how easy it is to build some of these applications.

05:40 You can load the JavaScript API from us.

05:42 It's hosted 24/7.

05:45 And then I've got a few components here about my map.

05:47 I've got a scale bar.

05:48 Got some layout components to kind of give me that nice easy to work with look and feel that works across all browsers.

05:57 I have a custom start extent.

05:59 I'm going to create my map control, pass it in a div and pass it in this custom start extent.

06:05 And then I'm going to add a layer to this map.

06:07 And then I have one of these layers like this case, ArcGIS tiled map service layer, and it just takes a URL.

06:12 In this case, it's a URL to an ArcGIS Server service.

06:15 And that's basically it.

06:16 I add that layer and I'm all done.

06:22 Now there's other types of layers that we can add to this...add to these maps.

06:28 We can look at maybe some dynamic maps.

06:31 Dynamic maps are maps that aren't precached, but they draw dynamically every time the user pans around the screen.

06:38 A new map is requested and the image gets sent back to the client and then it's displayed.

06:43 There's also a different type of map, a layer, excuse me.

06:48 In this case, it's a feature layer.

06:51 And a feature layer is something new that we've added as a new layer type within our latest release.

06:57 And actually we're not bringing the image.

06:59 We're not asking the server to draw the map.

07:01 We're saying, hey, server, give me all of the features in this extent.

07:05 And as I pan around the map, it's going to requery the features and then get them and draw them on the client side.

07:10 How do I know that it's getting the features and it's not the map because when I have the feature, I have the attributes that go with it.

07:16 I can touch the feature and get that information.

07:22 [Audience question] So is that an automatic pop-up or is that...?

07:25 Yeah, automatic pop-up.

07:27 You can just set what you want to be in the title and description and it'll just show up.

07:31 Binds, it binds to that layer.

07:38 So you can take these individual layers and you can look at them kind of one off...

07:42 ...like I showed you that each one of these is basically one layer.

07:44 Or you can take the layers and combine them together kind of in a mashup.

07:50 Take that basemap, that community map that we looked at.

07:53 We could take that dynamic map service and we could take another basemap on top of it and drop it in.

07:59 And you get kind of a very beautiful map actually.

08:02 This is that community basemap that we saw first.

08:05 On top of it is the population map that I showed that was dynamic.

08:08 And then on top of that we loaded some boundaries and labels.

08:13 And if we were to look at the source of this application, each one of these is its own layer.

08:20 So I've got this tiled basemap, this tiled map service layer here, got this dynamic map service layer with a set of a custom opacity....

08:29 ...and finally I've got another tiled map service layer that gives you that reference and created this multilayer map or mashup.

08:35 Now that's one way to put all these things together and create a seamless map that combines multiple layers.

08:45 But another way that I wanted to show you is there's many more maps that are available to you.

08:51 So a new site that we launched this year, ArcGIS.com, makes it really easy to author these kind of maps and share them out with people.

09:00 So I can look for thousands of maps that people have created.

09:03 I'm going to look for California fire.

09:08 I see several maps that people have created.

09:11 This one here, the Southern California Fire History is the one I'm most interested in.

09:15 Now if I look at that map, I mean, that's just a map to me.

09:20 But this map can easily be brought into my application environment.

09:24 I can load this into my JavaScript map and so forth.

09:28 If we were to look at the kind of the details, I see multiple layers that have been added to this map.

09:33 But that's just kind of the detailed information that's not really necessary.

09:37 But this map, we can take this map and share it out.

09:42 I have different ways to share it.

09:44 I can share a link to the map.

09:45 I can embed the map, copy and paste this into my blog or onto my website, and I'll have that map accessible to me.

09:53 Or, I can build an application from this map.

09:56 So we have like 20 or so kind of template applications that work with these maps that you author on ArcGIS.com.

10:03 So if we were to preview what does this look like in this kind of layout.

10:07 I get the legend for the map.

10:09 That's the important part that I want to show in this application.

10:13 The map is easily usable and all that it's taking is this ID.

10:21 So I could have built the app...I could have built this app by writing all that code to specify each layer which points to each service.

10:27 That's the custom extent.

10:28 Or I can just take that map ID and pass it into the application.

10:34 Just to show you briefly what that code might look like.

10:44 This looks a little more complicated than it really needs to be because it's taking that code from the URL.

10:49 But basically it takes this code and then we call this function.

10:56 Get Item, gets the web map, gives me that information about the map, and then I can create that...

11:01 ...pass that to my map control and boom, there I have an application.

11:16 Let's see, where was I going next? Okay.

11:18 So that's kind of about the maps and the layers that you can create.

11:21 So there's many ways you can do it.

11:22 I can write out each layer and add them to the map, you know, within the application...

11:27 ...or I can author a map that combines multiple map service layers together and I can load that in my application.

11:33 I could take one of these application templates that I showed you.

11:36 There's about 20 or so.

11:37 Some of them have more functionality than others, but they're meant to be easily downloadable, configurable...

11:42 ...and you just drop your own map into it.

11:46 But the other thing I wanted to talk about was some of the more kind of spatial analysis or different ways to look at data.

11:53 So at 10, we've made a big push to create...to make maps that aren't just spatially aware but also temporally aware.

12:04 So we have the notion of it.

12:06 A map service can be time aware so that the map can control that basically what's drawn.

12:16 You know, let's you bring up things with like new kind of sliders so I can zip through a year's worth of hurricanes.

12:24 In this case, these features are actually installed on the client so I can touch one of these hurricane tracts, get some information about it.

12:33 But it's a really interesting way to visualize data that might span across multiple years or decades or so on.

12:44 Another way to look at things through time is to render things temporally.

12:49 So in this example, we looking at recent earthquakes and it's just going to automatically start up.

12:56 It takes earthquakes from the last seven days, and we're just going hour by hour...

13:02 ...seeing what earthquakes are happening with respect to the current time period.

13:06 So that thing at the top is the time slider moving hour by hour...

13:09 ...and the color of the squares indicates how recent it is relative to where the current time is.

13:16 So the red ones are less than an hour, and the blue ones are one to 24 hours, and the yellow ones are greater than a day.

13:23 And then the size of the squares indicates its magnitude—how big was the earthquake.

13:29 This is a pretty simple application that you can build...

13:32 ...just to give you an idea of how you can put another spin on top of this kind of data.

13:43 We can also look at some kind of a spatial analysis.

13:48 So another thing, and I've shown you this service here, this population service.

13:56 I showed you that when I showed you that dynamic service.

13:58 That represents population.

14:00 Each pixel represents a certain number of people.

14:04 And we can build...we can expose that data through different means.

14:09 In this case, I can build a geoprocessing task that takes input like that input polygon, for instance...

14:17 ...and we'll summarize all of the cell blocks within that polygon.

14:22 So I can get it, say, in this case I'm just summing it up.

14:25 So it's about 10 million people who live in this user-defined polygon.

14:31 Another way to bring spatial analysis to your application is to do things about what's around me or what's near me.

14:40 So in this application, I want to find the closest health care facility.

14:43 I'm going to drop down to...maybe I want to find the three closest health care facilities.

14:47 I can touch the map, and it's going to generate me routes to the three closest one and then order them by the time.

14:57 And so forth.

14:59 Now maybe I want to make that four closest facilities.

15:06 Maybe I don't want to include the clinics.

15:08 You can get the idea.

15:09 Taking that data in real time, remapping it, and generating the new closest facility routes...

15:14 ...and then showing me how to get to those locations.

15:24 Okay.

15:26 Another new component to ArcGIS Server 10 is editing.

15:32 And editing is a way for you to elicit input from your end users.

15:38 You can build many types of editing applications.

15:40 You can build editing applications that are very specific and very workflow-centric.

15:45 Or you can build sort of kind of generic applications that let people sketch up on the map and...

15:50 ...contribute information that you want to collect.

15:54 We're looking at kind of a workflow-specific one.

15:58 In this example, we're looking at...we're looking at the basemap and these are oil and gas field boundaries.

16:05 So I can touch one of these field boundaries, gets me information about that field, selected, I see the size and so forth.

16:12 But this pop-up window that I have is not a static pop-up window.

16:15 It's taking user input.

16:17 So maybe I would want to change the status, not to oil, but it's actually gas.

16:22 Or, since I changed this to gas I'd better give it a number, you know...

16:27 ...do things like just out of the box give you the ability to check data before it goes in.

16:33 So, hey, it's supposed to be a number, I'll go ahead and enter that, and so forth.

16:40 Actually, all that did was update that attribute in that...on that layer for that feature.

16:46 By updating that, we can redraw the map and get a different view.

16:51 We can also create features.

17:00 So in this case here, we move over here.

17:03 This is an example of an editable fire map where you might have points of interest like fire department, campground.

17:10 I might have evacuation perimeters or actual fires.

17:14 Just by clicking on that map, excuse me, on that predefined template, I can let the user draw on the map.

17:24 It's going to actually create that feature.

17:28 I can name it and have a full rich text experience.

17:38 You can elicit whatever you...whatever's appropriate.

17:43 You can elicit that from the user, whatever's appropriate, whatever information you're trying to collect.

17:48 You can also edit information.

17:49 So I can touch one of these.

17:51 Maybe I want to scale it, rotate it.

17:54 Actually, no, I want to do vertex style editing where I touch each vertex and move it around.

18:01 That's all easily accessible to you to be able to build these kind of applications and share them out with your users.

18:08 If we were to look at the source of this, there's very little...very little code.

18:13 So we've added the layers.

18:15 So all I've got here is I've added three editable layers, feature layers, and I've added a basemap.

18:22 And then I've initialized my editor.

18:25 Get that information, create the...pass them to our widgets and start the widget up and then I have that editing experience.

18:32 Now, so that's kind of like the functional look of some of the things you can do.

18:36 And actually there's a lot more types of editing that you can do.

18:41 You can do editing when the user doesn't even know they're doing editing.

18:44 You can make it real, real simple.

18:47 It's really easy to create focused kind of editing experiences.

18:51 Another thing I wanted to point out is that our API, this is JavaScript API, and we're built on the Dojo JavaScript toolkit.

18:57 Dojo is an open source JavaScript framework and works really well for us but it doesn't work for everybody.

19:05 J-query is a hugely popular JavaScript framework.

19:08 It has a lot of activity.

19:10 You can definitely use J-query and work with our map.

19:13 So in this example of using J-query, we see a...we've swapped out some of the controls that might come with our API...

19:21 ...which is using Dojo and we dropped in some J-query specific controls and widgets and sliders and so forth.

19:33 There's also other frameworks like EXTJS.

19:36 This is another JavaScript framework that gets lots of user...and makes it really easy to create powerful and easy-to-use user experiences.

19:45 Different slider, different control.

19:47 Each one of these frameworks...actually the frameworks are what makes it easy to develop JavaScript applications now.

19:53 You know, five, ten years ago, it was really difficult to develop HTML and JavaScript applications...

19:58 ...because of the fragmentation of the browsers.

20:00 The browsers are getting better, but the frameworks actually abstract away that complexity.

20:05 So it's much easier now to build these kind of apps.

20:15 So, which brings me to where we are today.

20:17 'Cause actually today is very exciting.

20:19 I've shown you all browser-based applications that you can run, you know, in Chrome, Safari, Firefox, Internet Explorer.

20:27 The desktop browsers are getting better and better.

20:30 Internet Explorer 9 is going to be light years of where Internet Explorer 8 was, and so on.

20:35 But some of the even the more exciting things about building HTML and JavaScript applications is with the advent of HTML 5.

20:43 HTML 5 is kind of a big bucket of functionality that vendors like Apple, Google, and Microsoft are pushing...

20:53 ...and it's not just for the desktop browser anymore.

20:55 A lot of it's being driven by the mobile clients.

20:58 And so what I wanted to show you is a plethora of devices that target multiple applications.

21:13 If I can get the things to flip up here... This is the new BlackBerry...BlackBerry Torch.

21:21 A little out of focus but, looks better on here.

21:25 But the new BlackBerry Torch is also touch aware.

21:28 It's built with a web kit-based browser so I can just touch and move the map around.

21:32 It's going to regenerate that map request and then draw it on the screen.

21:38 Let's swap that one out with something like the Droid.

21:49 Same kind of idea.

21:50 I can touch it.

21:51 I can access the HTML device, I've lost my connection here on my Droid.

22:02 I'm not used to all these devices.

22:04 I'm not used to all these devices.

22:05 I felt like a weird, a weirdo carrying all these things on the plane and passing them through security.

22:11 I got a lot of odd looks.

22:13 [Audience question] Can I ask you a question?

22:14 Um-hmm.

22:15 [Audience question] _____ are in HTML 5?

22:16 Yeah, all HTML 5.

22:17 [Inaudible audience question]

22:21 Web kit enabled? HTML 5. And open this up here.

22:30 Yeah, that's actually the beauty of this.

22:32 These kind of sort of look like native applications, but if I pull this down, you see it's just got the HTML bar at the top.

22:40 And I can zoom in, you know.

22:43 Some of them support different functionalities.

22:45 So like the iOS has a much richer kind of in the browser, you know, the pinch, pinch zoom kind of functionality.

22:56 Some of the other mobile clients are taking longer to come up to speed.

23:06 Swap that one out.

23:11 And we'll look at something like this.

23:13 Let me zoom out a second.

23:21 Now we look at the iPad.

23:24 The iPad also I can just click and move my finger around, rerequest the map.

23:29 I can zoom in.

23:30 This is just an HTML application.

23:33 There's no code different from the code that I showed you on the other applications.

23:37 You can do things like draw on the screen.

23:43 You can imagine I could actually then take that and push it into a server...

23:48 ...with our new ArcGIS Server which supports feature-based editing.

23:52 All these devices are open to you to be able to reach your customers or reach the people who you're building applications for...

24:02 ...your end audience.

24:04 And that's kind of the exciting part about where the browser-based development is today...

24:09 ...is that without being an expert in the iOS or an expert in Java development or expert in WinPhone 7 Silverlight development...

24:20 ...you can still touch a lot of these devices which is simple HTML and JavaScript.

24:25 And you can build extremely rich and functional applications, too.

24:29 Applications that leverage more HTML 5 functionality like local storage, SQL storage...

24:36 ...so you can create full relational SQL queries against, through JavaScript into your browser...

24:43 ...working with data offline via the application cache.

24:46 There's quite a bit of things you can do.

24:49 Now they're not the same apps that you would build on the desktop.

24:53 What we're...what at least what I'm starting to see is that a lot of the people are going to build applications that target the iPad...

25:00 ...and that basically would work the same on the desktop device.

25:04 The difference between the iPad or the Tablet and the desktop devices, it's less precise.

25:10 You know, you're not...you don't have a precise mouse on the iPad, it's your fat finger.

25:16 And also you're not going to do things like listen for events like hover or move over because, no, you're touching the screen...

25:24 ...you're moving the map.

25:25 You're not hovering over it.

25:27 So you'll start to see more applications where it's developed first for the iPad, but then it works just perfectly fine on the desktop.

25:35 Now the mobile devices have a different...when the smartphones...it's a different...it's a different animal, really.

25:43 What's interesting about the smartphones is that they're not...what's interesting about the smartphones...

25:57 ...is that they're not about the same thing that you might get on the iPad or the same thing you might get on the desktop.

26:05 It's in most cases focused around where you are.

26:08 The location and the GPS location of the device is extremely important to build these kind of focused apps.

26:14 Especially in the mapping field.

26:16 Now if you're reading a newspaper, it might not be quite as important...

26:19 ...but if you're building a mapping application, location is the most important thing.

26:24 And so you want to build applications that kind of take that location into account.

26:30 So this is an example of an application actually Kelly built using the Dojo X mobile framework...

26:36 ...which kind of makes it really easy to build these kind of applications.

26:40 See it's just a browser app, but it looks like a desktop, excuse me, a native iPhone application.

26:46 And if you're to run this on the Droid, it would look like a native Droid application, all just through CSS.

26:52 But I can do things about, eh, what coffee shops are nearby, give me a list of those coffee shops, you know...

26:58 ...move this thing up and down, and you want to route to it, takes that location...

27:03 ...routes me to that closest to that coffee shop that I picked out, an easy way to get directions.

27:09 A kind of nice fade in and fade out.

27:13 It's very exciting time to build these kinds of applications without having to invest a lot of effort in learning the native API.

27:24 Or working through the app store.

27:26 Now if your goal is to make money, make lots of money, then the app store is still very attractive...

27:33 ...because you get a very focused audience.

27:35 But if your goal is to just get information out, if that's your mission is to get information out in the best possible way...

27:42 ...then building these HTML applications is really the way to go to touch all of these devices.

27:49 So let me point you at to a whole bunch of these samples that are targeting kind of the mobile devices.

27:58 And this is also really cool on this location with temporal renderer.

28:02 Maybe after we can walk around at _____, but basically it's going to use some of our client-side technology...

28:09 ...to map where you were and how long it's been 'til you've been to that location.

28:15 And but using the GPS device so as you're walking along.

28:18 Okay.

28:21 So kind of give you kind of a review of what everything that we have in the API and then kind of like a summary.

28:30 Now I want to turn it over to Kelly to kind of show you, this is just kind of samples that you've seen.

28:35 But let's take some real data and do something cool with it.

28:39 As Jeremy mentioned, we've looked at a lot of applications that use basemap data that comes from ArcGIS Online...

28:45 ...or some of the demographic data.

28:47 But now let's look at an example that uses some real-world data.

28:50 So there's a local website called DataSF that has data for the data for the San Francisco Bay area.

28:57 One of the datasets that we'll look at is trees.

29:02 So we'll search for trees, and there's a dataset here that's a street tree list.

29:06 So it's a list of all the street trees in the city of San Francisco.

29:10 So there's 60,000-some features in this dataset.

29:15 So this isn't really the kind of data that you want to take and just drop on top of Google.

29:19 That's a lot of data to draw on the client, and you probably wouldn't get the best performance.

29:25 This data is in CSV format, so it was really easy to take that data, load it into our database.

29:32 We set a couple of properties, and we'll look at those.

29:34 We did things like define symbology so we get some nice symbols for our data when we're looking at it in our mapping application.

29:42 We can enable time on the data so you can build applications that are time aware like the ones Jeremy showed you...

29:48 ...where you can move through the data over time.

29:51 You can enable editing.

29:52 You can allow people to upload attachments.

29:54 You can do all this stuff on your data that's loaded into the database, publish it as a service, and then consume it from our applications.

30:02 So we did this with the street tree data.

30:07 And we published this as a service, and we'll look at it in ArcGIS services directory.

30:13 So this dataset, if we scroll down a little bit, you can see that there's a layer in here, and we have some symbology defined.

30:24 So in this case there's some information associated with this data that describes the types of trees you have.

30:32 In this case, we've separated them into two categories, landscaping trees, so like shrubs maybe get one symbol...

30:39 ...and all the other trees get another symbol.

30:41 So you can symbolize by attribute information.

30:45 So here, as Jeremy mentioned, is that data drawn just as a big blob.

30:48 Not very useful.

30:49 You know, it's going to take a little while to draw, even, you know, from the server.

30:53 So let's look at a more realistic application, a very simple...a simple application.

31:00 So here we are zoomed in to more of a street level view.

31:03 We can see our trees here.

31:05 It's more realistic.

31:06 We can pick out the individual trees.

31:09 We can click on the tree, and we can get a pop-up window that pops up with attribute information directly from that service.

31:19 Let's look really quickly at the code for this.

31:22 We also have, you know, a little link we've added to this pop-up window.

31:25 It finds the Wikipedia entry for that particular genus and species and pops it up in a separate window.

31:34 So let's look at this and see that really we don't have to write much code at all.

31:38 So Jeremy showed you some of this stuff earlier where we defined extent...

31:41 ...and this is where we're saying we want to zoom into a particular area.

31:45 We're adding a basemap layer, that really nice topo map.

31:50 We define our templates.

31:51 So this is defining what that pop-up window is going to look like.

31:54 We're pulling attributes from, thank you, Jeremy.

31:58 We're pulling attributes from that service.

32:02 And then here's really all we're doing.

32:04 We're creating a new feature layer.

32:07 We're giving it the URL to that service on the services directory.

32:13 And we're adding that to the map.

32:15 That gives us those pop-up windows with all that attribute information displayed.

32:20 That gives us nicely rendered data, so we have symbology, our nice tree symbol shows up.

32:27 And we get that pop-up capability with just a few lines of code.

32:31 So it's definitely one of the benefits.

32:32 It would be quite a bit more work if we were, you know...

32:35 ...parsing that data and adding it to the map and applying symbology and working with attributes, right.

32:39 Simplifies the process.

32:46 Now we're going to look at another application on Firefox, I guess.

32:52 This one is another view of that same San Francisco trees dataset.

32:57 We enabled it for time so the data available on the San Francisco data site has time associated with it...

33:04 ...the date and time these trees were planted.

33:08 So we can have a drop-down list.

33:10 In this case, we're filtering this data by a particular type of tree.

33:15 So let's say we want to look at all the ginkgo trees in San Francisco.

33:19 We can choose that.

33:22 We have our time slider, and we can step through and watch as new trees get planted over time.

33:29 So we're stepping through this data over time...

33:32 ...and sort of filtering this large dataset of 60,000 records to view a more realistic subset.

33:43 Finally, I want to show you, if I can find the right phone in this multitude of devices.

33:58 Okay, so we have this same data and going to look at it on the iPhone.

34:09 So this application looks really familiar.

34:11 It's sort of a modification of the find nearby restaurants and coffee shops application that Jeremy showed you earlier.

34:18 But we wanted to show you that you can use your own data with this...

34:22 ...and build mobile applications that take advantage of all these things that Jeremy's shown you throughout this presentation...

34:27 ...analysis and mapping and graphics.

34:30 So in this case we can specify a tree type.

34:35 It brings us back a list of the trees nearby, so it queries and finds which trees are near your current location...

34:43 ...and routes you to that particular tree.

34:48 So this is that same sort of experience we just looked at, but here we're looking at it with this tree data.

34:55 Now in this case, we're not using the geolocation API only because we're not actually in the city of San Francisco.

35:01 So if we tried to find trees nearby us, they'd, you know, be pretty far away.

35:05 So we hard coded a position in here, but it would be very easy, just a line or two of code...

35:11 ...to switch that over to use the geolocation API.

35:14 Or allow users to enter an input address or select an address from a predefined list of addresses.

35:23 This kind of shows why you'd want to put it in the server.

35:25 So you can do these kind of queries, leverage the power of the database, filter it down, you know...

35:31 ...pull slices of data out by time or by tree type and then it makes it accessible for these kind of applications.

35:38 You can leverage some of the other analysis capabilities I showed you like the find closest facility, the routing.

35:44 You could think of other types of questions you'd want to ask like what's around me, what's near me...

35:49 ...get me to the nearest six places in the most efficient way possible.

35:54 These kinds of applications you would build with these mobile devices where the input is basically the location of the person...

36:00 ...and then whatever they're interested in.

36:02 So that was kind of a quick, a quick look of what we have in our API.

36:09 Just some, tried to show some examples of what you can do.

36:15 The best way to learn more about what we have here is to get to our JavaScript API, and I think if you go esri...

36:22 ...links.esri.com/JavaScript.

36:25 Links.esri.com. I'm going to try that here.

36:28 [Audience question] I think those links are on that flash drive you passed out.

36:30 Okay, cool.

36:31 Oh, great. Okay.

36:32 And, it'll take you right to this home page.

36:42 So links.esri.com/JavaScript, and you can try out more of what we have here.

36:47 Then, actually, there was a question earlier.

36:48 I'm going to make sure I showed it before.

36:50 If you wanted to download this API, in the Frequently Asked Questions, we have links to the library.

36:58 So you can download it and host it on your own server, download the SDK and host it offline.

37:03 The best thing to do is to just work with the one that we host because it's a 24/7 CDN-hosted.

37:08 It's the safest thing to do.

37:09 But for intranet applications or if you just want to have control, you can download and deploy on your own website.