

Performance Tips and Tricks: ArcGIS Desktop

Transcript

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Welcome to our ESRI Instructional Series podcast, Performance Tips and Tricks: ArcGIS Desktop. My name is Natalie Vines, and I'm an instructor in the Educational Services department at ESRI in Redlands, California.

And I'm Bronwyn Agrios, also an instructor in the Educational Services department in Redlands, California.

Bronwyn: Today, we will be exploring ways to boost your performance when using ArcGIS. This discussion is tailored to ArcGIS Desktop users.

Natalie: Bronwyn and I will now discuss five areas where you can improve performance when working with ArcGIS Desktop. Our first topic will be working with labels; our second topic, editing; third, we'll discuss navigation; fourth, live relationships; and our fifth and final topic, will be ways to improve performance when working with ArcCatalog.

Natalie: Let's begin with our first topic—labeling, and there are three tips I'd like to discuss here. The first tip is to use label locking. The ESRI Standard Label Engine is constantly trying to place as many labels on your map as possible. So, as you pan and zoom around your map, your labels will constantly redraw. They're constantly looking for the best location. You can really take a performance hit for this if you're working with hundreds of thousands of labels. Every time you just move a little bit around your map, your labels redraw. We can avoid this by clicking the Label Off button on our Labeling toolbar. How this works is, when we click that button, all of our labels and our current extent will remain fixed. We can then zoom out and pan around our map without any of our labels redrawing. Also, no new labels will appear, so only the labels that were in my current extent when I locked will remain on my map.

The second tip is to work with label classes. Now, it's a good idea before you save your map document or when you're working with your map in general, to turn off any text that you really don't need to see. We're not just limited to the option of turning on or off labels for an entire layer. We can divide those labels up into label classes. Let's say, for example, I'm working with a world cities layer. I could create one label class for my capital cities, and a separate label class for all my other cities. In this way, I can choose the font, and just the general appearance of the labels for my capital cities, independent of my other cities, and I can also turn them on and off

independent of each other. Perhaps, I don't want to turn off the labels for the entire layer, just for my non-capital cities. This way, I have a little bit more control over which text I place on the map.

The third tip is to work with simple renderers. When we're creating labels in ArcMap, we have a lot of options for special effects. We could add halos behind our labels, for example. The more complex you make your label, the longer it's going to take to draw. So, as you're adding all these special effects to your labels, keep in mind that you could take a performance hit if you start adding these up together.

Bronwyn: When I'm working with labels, I generally set a scale-dependent display on my labels, because it allows me to have more control over when they will be visible. If I'm zoomed out to a scale of 1:5,000,000, then maybe some of my labels aren't relevant. Let's say they're all overlapping each other, or I can't really distinguish what the label is actually labeling. Why draw them? We may as well make them visible when we are zoomed in to a larger map scale.

Natalie: And this is another great reason to work with label classes. So, perhaps if I'm zoomed out to my full extent of the world, I only want to see my capital cities labeled. As I start zooming in to the country level where the other city labels actually become readable and relevant, I could then have that label class turn on. So I could set my scale-dependent display for each of my label classes independent of each.

Bronwyn: That's a really good tip, Natalie. Our second topic is editing. When I'm setting up an edit session in ArcMap, the first thing I usually do is set up my snapping environment. When I'm setting up my snapping environment for a map layer, I try to only turn on either the edge, end, or vertex options for that layer—the one of those that I need. For example, if I need to digitize a point to snap to the end of a line feature, I will turn on the End snapping option for that line feature, so I ensure that that point sits accurately on the end of the line. I will not turn on all three of those options. The reason I don't want to turn all of my options on—edge, end, and vertex—is that when I move my mouse around the map display, it's constantly scanning for where it can snap to. This is going to impose a performance hit. Another thing with your snapping environment is to make sure that you set your snapping tolerance as small as possible while still maintaining an effective editing session.

Another tip when editing in stream mode, when you're digitizing a line, is to try and keep the interval at which vertices are placed quite large, or don't make that interval too small for the feature that you're digitizing in stream mode. When we're digitizing in stream mode, I can move my mouse and vertices are automatically placed without me having to click. So, in the Editor options, I can define the interval at which those vertices are placed. If I place too many, again, I'm asking ArcMap to draw more information than is really necessary. So, one thing we can do is set that interval to be larger, so vertices are placed at a larger distance from each other, as well, you can use the geoprocessing tools. There are a few tools available to you in the Generalization toolset in the Data Management toolbox. Simplify Line and Simplify Polygon, as well as Smooth Line, will help to remove some redundant vertices, as well as smooth out arcs.

Natalie: For our third topic, let's discuss ways to improve performance when navigating. The first tip I'd like to mention is to work with the Magnifier window. We can access this from the Window pull-down menu. When we do so, a new window displays on top of our interface, and it's going to magnify whichever features or labels are underneath that magnifying window, so we can get a closer look at our features without having to zoom in. We can then take that Magnifier window and just drag it around our display to take a closer look at particular features. This improves our performance because it prevents us from having to constantly zoom in and out, and, you'll find this useful when you're in an edit session especially.

A second tip is to use bookmarks, and we create and view bookmarks from the View pull-down menu. Bookmarks work by automatically zooming to an extent that you have predefined. Let's say, for example, you are working with data for an entire county, and your projects this month have you working with three different cities in particular. Instead of viewing the full extent of your entire county, and then panning and zooming over the city A, doing your work there, panning over to city B, and doing your work there, you could just set a bookmark for each of your cities, so for each of your study areas. So, you choose the city A bookmark, and you work in that area, and then you choose the city B bookmark, and your display automatically changes to that study area.

Bronwyn: Something I want to add in there, Natalie, is that by using magnifiers and bookmarks, we're actually reducing the amount of calls that we have to make to the server to fetch data. In that case, we're improving performance.

Natalie: Bronwyn, could you discuss some of the ways we can improve navigation when working with ArcGIS version 9.2?

Bronwyn: Sure. There are a lot of new things happening in the ArcMap interface in version 9.2, especially with navigation. One thing that I'd like to mention is My Places. This is very similar to working with bookmarks, in that we can set a defined extent of an area of interest and then move directly to that extent. Now, the big deal with My Places is that it's not specific to a map document or even a data frame like bookmarks are. My Places have their areas of interest stored in a file outside of the map document.

Natalie: So, Bronwyn, bookmarks are data-frame and map document specific. So, if I've got 10 map documents, 10 different data frames, all working with the same city and county data, could I just set my places once, and then not have to set a bookmark inside each map document?

Bronwyn: Exactly. That's a great example of where you would want to use My Places. Something else new in ArcGIS 9.2 is that we can customize the Full Extent button on the Tools toolbar. We can customize how large or small we want the Full Extent to be. If I have the entire United States loaded into my map document, but again I'm only working with a single county, when I press Zoom to Full Extent, I don't want to go out to the full extent of the United States. I want to just go out to the full extent of the area that I'm currently working on. We can set that through the Data Frame Properties, and you'll see these additions in version 9.2 of ArcGIS.

Natalie: Bronwyn, am I correct in thinking that this would be really useful, let's say I'm working with the entire United States, but every couple months or so my study area focus changes, and I can just change my full extent button?

Bronwyn: Exactly correct. You can change it from the Data Frame Properties as often as you like.

Now, let's look at our fourth topic: live relationships. Live relationships are a particular type of relationship that we can set up inside ArcGIS. Where you'll see these relationships, for example, is with geometric networks and relationship classes. Live relationships can be poor for your performance, because when you query a single feature class that participates in that relationship, all of the other feature classes that participate will also be queried. For example, if I'm in

ArcMap, and I'm working with a geometric network, every time I move my mouse around the map, or pan and zoom, or even make a query, all the feature classes that participate in that geometric network will be pulled upon. So, instead of just looking at a single attribute table or a single set of geometry every time, I'm potentially looking at three or four attribute tables and sets of geometry.

Natalie: Bronwyn, I also like to work with feature datasets. Am I going to take a performance hit for that?

Bronwyn: Yes. Feature datasets are also a live relationship. Because we put multiple feature classes inside this container, and when you query one of these feature classes, these other feature classes are going to be pulled upon. That's a really good point, Natalie.

Natalie: Okay, Bronwyn, so what about topology? Do these same rules apply there?

Bronwyn: Topologies are not a live relationship, and you will not see an adverse effect on your performance by using them. The reason is that when we set up a topology, we add multiple feature classes, we set up rules, and we define that relationship between those feature classes that are participating. That relationship is not constantly being queried as it is with a relationship class, or geometric network, or even feature classes in a feature dataset. The relationship is being queried when you ask it to be, by validating your topology.

Natalie: Let's finish up with our fifth and final topic, working with ArcCatalog. The first tip here is to limit the number of active database connections you have within ArcCatalog. Our second tip involves previewing your data. I recommend using ArcCatalog to preview your data. You can look at an individual feature class by using the Preview tab. We can preview both the geography and the attribute table. I suggest this instead of going into ArcMap and adding data to your data frame to preview your features. Perhaps you're not quite sure which feature class you want to work with. If you go into ArcMap and continuously add all of these different layers to your map document, this could take some time, and there's no point in doing that when you could just go into ArcCatalog and take a look at your features using that Preview tab.

Bronwyn: Natalie, what if I want to view the contents of an entire folder or an entire geodatabase? Is there an option in ArcCatalog for that?

Natalie: Great question, Bronwyn, and yes. I recommend working with thumbnails in that situation. What we do with a thumbnail is to go into ArcCatalog, we preview our individual feature class, and we just click a button to create a thumbnail that takes a snapshot of that data. That way, when we're looking at an entire geodatabase or entire folder, and using the Contents tab, we can view all those thumbnails that we created, and this improves your performance because you're no longer calling on those features. You're just taking a look at an image, and that's much faster than calling on the feature class.

Bronwyn: Something else I want to add to thumbnails is, as Natalie mentioned, it's just an image, so if you make some edits to your feature class, your thumbnail will not reflect those changes. You'll have to take a new thumbnail capture.

Natalie: I especially recommend using thumbnails when you're not the one who named the data. Perhaps someone chose a naming convention that really doesn't mean anything to you, and you could waste a lot of time going through and looking at all this data over and over again, and trying to figure out what does this name mean in relation to my data. When you create that thumbnail, then you can just look at an image of that data. You will always know what is contained within that feature class.

In conclusion, let's review five areas where we can boost our performance when working with ArcGIS Desktop. First we discussed labeling. We can lock labels, work with label classes, use simple renderers and scale-dependent displays to improve our performance there. Our second topic was editing. Bronwyn discussed how you should set up your snapping environment, how to work with stream mode in ArcMap, and how to use geoprocessing tools to generalize your features. Our third topic was navigation. We discussed the Magnifier window, bookmarks, and with ArcGIS version 9.2 we can also use My Places and the customizable Full Extent to improve our performance.

Bronwyn: Our fourth topic was looking at relationships and how to set up relationships inside ArcGIS. We looked at live relationships, geometric networks, relationship classes, and feature datasets, and all three of those could potentially have an adverse effect on your performance. Natalie asked a good question about topology. Well, topology does not have an effect on our performance in the same way that live relationships do. Our last topic was ArcCatalog. We

looked at having active connections open in ArcCatalog and how that can affect performance, as well as using the Preview tab and thumbnails to have a quick look at our data without having to go into ArcMap.

Natalie: For further information on improving performance, check out our other podcasts, *Performance Tips and Tricks: ArcSDE Client-Side Optimization* (this one also has some great tips and tricks for working with ArcMap), and also *Performance Tips and Tricks: ArcIMS Optimization*.

Bronwyn: Finally, check out our instructor-led training courses at training.esri.com.

Thank you for tuning in to this session of our ESRI Instructional Series podcast. Please stay tuned for future podcasts.