The CEDRA Corporation's

COMMAND OF THE MONTH

A monthly information bulletin April 2008

FEATURED COMMAND

Find Points at Line End Points

Application Description

Have you ever had the need to find the point feature that is closest to each end point of a line feature. Well if you have, you aren't alone. This is a very common problem that ArcGIS users encounter.

The typical scenario is that there are two layers, one point layer and one line. It is then desired to find the feature in the point layer that is closest to each end point of the lines in the line layer.

Once this is done it is then desired to transfer an attribute from the point, which is closest to the line's end point to the line feature itself. This attribute could be a node number, node type or any other attribute of interest.

The CEDRA Solution

To address this issue, the [Points at Line EPts] command has been added to the {Skeletonize Tools} menu combo box, which is within the CEDRA-Skeletonization-Tools toolbar shown in Figure 1. Note that this is a new command that has been added to the combo box within the last month.

Scrolling down in the {Skeletonize Tools} menu combo box, the [Points at Line EPts] menu command is the second from the last command in the scroll down list (see Figure 1).

Command Overview

Using the [Points at Line EPts] command, the user is able to:

(a) determine the point feature that is closest to each end point of one or more line features,

(b) transfer from the point feature, which is closest to a line's end point, up to two attributes to the line feature, and

(c) generate a report containing a listing of the line features in which: (a) a point feature was not found to be close to one of the line's end points and (b) where more than one point feature was found to be close to a line's end point.

> ***Command Of The Month bulletin***
>
> *This month's issue discusses the process of finding point features which are "close" to each end point of one or more line features.*

In using this command, the user is able to specify a proximity tolerance value that is used to determine "closeness" of a point feature to a line' end point.

The lines and points that are processed by this command can reside in more than one layer. That is to say, the user can process, in a single session, lines from several different layers and points from another group of different layers.

The line and point features that are examined are taken from the active layers at the time the command is invoked.

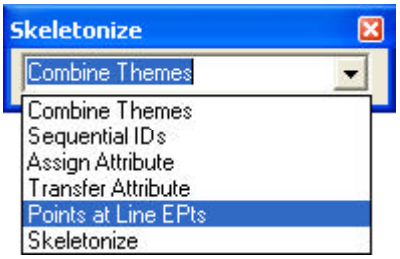

Figure 1
CEDRA-Skeletonization-Tools Toolbar for ArcGIS Users

Command Operation

➤ **1** **Activate** the various point and line layers to be processed.

➤ **2** **Select** the line features to be processed. If all of the features in a line layer are to be processed, the lines in that layer do not need to be selected.

➤ **3** **Scroll** down in the {**Skeletonize Tools**} menu combo box, and **select** the [**Points at Line EPts**] command.

If there are no active point and line layers at the time the command is activated, or if only one of the two required layer types is active, one of the three error message shown in Figures 2 through 4 will be displayed.

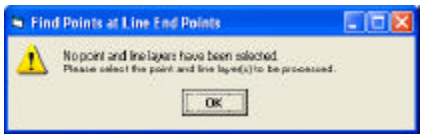

Figure 2
No Selected Point and Line Layer Error Message

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Figure 3
No Selected Line Layer Error Message

Figure 4
No Selected Point Layer Error Message

At this point, click the OK button, activate the appropriate layer(s) and re-select the command.

➤ **4** **Enter** the appropriate information for the various parameters shown in Figure 5.

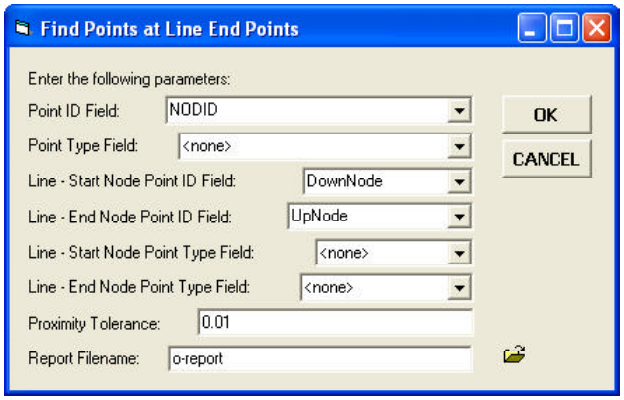

Figure 5
Points at Line EPts Parameters

In specifying the information requested by the parameters shown in Figure 5, the user should note the following:

• The *Point ID Field* parameter is a required item and represents the attribute or field in the point layer that is to be transferred to the line layer.

• The *Point Type Field* parameter is an optional item and represents a second attribute or field that is to be transferred to the line layer. If only one attribute is to be transferred from the point layer to the line layer, then the user should specify the <none> option for this parameter.

• The *Line - Start Node Point ID Field* parameter is a required item and denotes the attribute or field in the line layer that is to receive the point feature's *Point ID Field* value. This value belongs to the point feature that is determined to be closest to the start point of the line feature.

• The *Line - End Node Point ID Field* parameter is a required item and denotes the attribute or field in the line layer that is to receive the point feature's *Point ID Field* value. This value belongs to the point feature that is determined to be closest to the end point of the line feature.

• The *Line - Start Node Point Type Field* parameter is an optional item and denotes the attribute or field in the line layer that is to receive the point feature's *Point Type Field* value. This value belongs to the point feature that is determined to be closest to the start point of the line feature. If the <none> option has been specified for the *Point Type Field* parameter, then the <none> option should be specified for this parameter as well.

• The *Line - End Node Point Type Field* parameter is an optional item and denotes the attribute or field in the line layer that is to receive the point feature's *Point Type Field* value. This value belongs to the point feature that is determined to be closest to the end point of the line feature. If the <none> option has been specified for the *Point Type Field* parameter, then the <none> option should be specified for this parameter as well.

• The *Proximity Tolerance* parameter denotes the distance in world units that a point is to be considered as being close to an end point of a line.

• The *Report Filename* parameter denotes the name of an ASCII based file that will contain the results of the processing.

The file icon to the right of the data field enables the user to display a typical file browsing dialog box from which the user can select an existing file or enter the name of a new file in a particular folder.

➤ **5** **Click** at the **OK** button to begin the processing,
or
click at the **Cancel** button to abort the command.

If the OK button is selected, the command checks if the specified report filename exists. If it does not, the command begins its calculations.

If the report file exists, the command displays a Yes/No/Cancel message box querying the user as to how the existing file is to be handled. Selecting the Cancel button aborts the command. Selecting the No button results in the existing file being appended. Note that the new results are added at the bottom of the existing file. Selecting the Yes button results in the existing file being overwritten.

In performing its calculations, the command processes the selected

line features in the active line layers. If there are no selected line features in a line layer, then all of the line features in the line layer will be processed.

During the processing, the command determines the coordinates of each end point of the line. The command then performs a search for all point features that fall within the proximity tolerance for each end point.

If there are no point features that fall within the proximity tolerance for an end point, a message to this effect will appear in the report file. Likewise, if there are more than one point feature that fall within the proximity tolerance, a message to this effect will appear in the report file.

If only one point feature has been found to be close to a line's end point, the Point ID Field and if specified the Point Type Field values for the point will be transferred to the line feature under the appropriate user-specified line layer field names.

Additionally, if there are more than one point feature within the proximity tolerance, the command will transfer the attribute values of the point feature that is found first.

Once the command has completed its processing, an information message box similar to that shown in Figure 6 will be displayed. The data shown in this message box denotes the time it took to perform the processing.

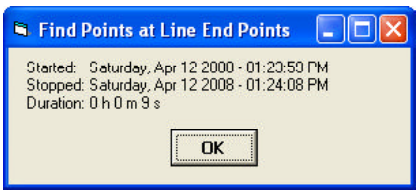

Figure 6
{CEDRA Commands} Combo-Box

```
Summary of Results for the analysis of:
Find Points at Line End Points

Proximity Tolerance: 0.010000

Processed 243 Lines

Started:   Thursday, Apr 3 2008 - 11:42:55 AM
Stopped:   Thursday, Apr 3 2008 - 11:48:54 AM
Duration: 0 h 5 m 59 s

     1: TRUNK - OID 85   no point close to start point
     2: TRUNK - OID 87   no point close to end point
     3: TRUNK - OID 148   no point close to start point
     4: TRUNK - OID 148   no point close to end point
     5: TRUNK - OID 167   no point close to end point
     6: TRUNK - OID 168   no point close to end point
     7: TRUNK - OID 176   no point close to end point
     8: TRUNK - OID 188   no point close to end point
     9: TRUNK - OID 234   no point close to end point
    10: TRUNK - OID 235   no point close to start point
    11: TRUNK - OID 235   no point close to end point
    12: TRUNK - OID 236   no point close to start point
    13: TRUNK - OID 237   no point close to start point
    14: TRUNK - OID 237   no point close to end point
    15: TRUNK - OID 242   no point close to end point
```

Figure 7
{CEDRA Commands} Combo-Box

Presented in Figure 7 is a sample report file illustrating the syntax of the messages that can appear in the file.

Summary

The [Points at Line EPts] command is a useful tool for transferring a point feature's attribute to a line feature. Those who are involved in applications where a line feature needs to have a point feature's OID or some other unique identifier, such as sewer or water modeling, will find this command particularly helpful.

It should be noted that this command was introduced as a result of a request by a user.

As always, users who have a need for functionality that is not presently available in CEDRA software should feel free to forward these requests to CEDRA, as well as, any other comments or suggestion you may have.

If you have a request for Command Of The Month, feel free to phone, fax or e-mail your request to The CEDRA Corporation.