Network Analysis with ArcGIS Online and On-premise Services

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Introductions

• Who are we?
  - Network Analyst Product Engineers

• Who are you?
  - Network Analyst users?
  - ArcGIS Online users?
  - Trying to figure out what is ArcGIS Online?
Topics

- Online and on-premise network analysis services
- How to access the online services
- How to use the online services
- On-premise services
- When to use online and on-premise services
- Support and resources
- Network Analyst at the User’s Conference
- Questions
Online and on-premise services
Online services

- Ready-to-use services published by Esri that are run in an Esri-administered cloud infrastructure

On-premise services

- Services published by you using ArcGIS software on your own IT infrastructure
What you need for on-premise services

- Your own ArcGIS Server software
- Hardware to host the server
- Staff to manage the IT infrastructure
- Your own street data modeled as a network dataset
- ArcGIS Online subscription
- Your analysis inputs
- May need your own apps to use the services
What you need for online services

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Network Analysis Services
Solving transportation problems
Online services
Data coverage

- Work globally
  - Currently 144 countries.
  - New countries are added periodically
- Use high quality street data
  - Real time traffic where available
  - Support for vehicle weight, width and height restrictions
  - Can use preferred truck routes or avoid toll roads
- Driving mode only

View web map
Accessing services

• All services are secured and require ArcGIS Online organization subscription

• Existing ArcGIS Desktop users get a free organization subscription

• Sign up for a 30 day free trial at www.arcgis.com
Using services

- Two main out of the box clients
  - ArcGIS for Desktop
  - Analysis tools in ArcGIS.com map viewer
- Some services supported in other ArcGIS apps
  - Collector for ArcGIS
  - Operations Dashboard for ArcGIS
  - ArcGIS Viewer for Flex
  - Route Planner
- ArcGIS web and runtime SDKs
  - [http://developers.arcgis.com](http://developers.arcgis.com)
Using services with ArcGIS for Desktop

- Supported with ArcGIS for Desktop version
  - 10.0 SP5
  - 10.1 SP1 *(10.1 final is not supported)*
  - 10.2
- Single sign-on support with 10.2
- Need to create ArcGIS server connections with 10.1 SP1 and 10.0 SP5
Connecting to online services in ArcGIS for Desktop
Using services with ArcGIS.com map viewer

- Need to add your inputs to ArcGIS Online

- **Layers and data you can analyze**
  - Feature service
  - Map service
  - Comma-separated values (CSV) file (.csv)
  - GPS exchange format file (.gpx)
  - Shapefile (.zip)
  - GeoRSS web feed
  - Map notes
  - Route layers
Directions (Route) Service

• Point-to-point routing – Simple Route

• Find the best route for visiting a series of stops that minimizes travel time or travel distance – Optimized route

• Use live traffic conditions

• Driving directions in many languages
Using Directions service

• Use from Directions widget in ArcGIS.com map viewer
  - Can save results as a web map layer for further analysis

• Use from Find Route button in ArcMap
Mileage summary by state

Find best route and determine the miles covered by the route in each state
Closest Facility service

• Find the closest facilities from each incident

• Generate routes and driving directions

• You can also…
  - Use live traffic conditions
  - Limit the search distance
  - Limit the number of facilities to find
  - Travel from the facility to the incident
Using Closest Facility service

- Use Find Nearest analysis tool in ArcGIS.com map viewer
- Use FindClosestFacilities geoprocessing tool
Service Areas (Drive Times) service

• Find the area you can reach from a location in a given time period

• You can also…
  - Solve for many locations
  - Use multiple drive time values
  - Analyze for different times of the day
  - Specify the direction of travel
Using Service Areas service

- Use Create Drive Time Areas, Summarize Nearby or Enrich Layer analysis tool in ArcGIS.com map viewer

- Use GenerateServiceAreas geoprocessing tool
Demographic summary

Find demographic information within certain drive times from store locations
Vehicle Routing Problem (Fleet Routing) service

- Route a fleet of vehicles to service a set of orders

- You can also specify:
  - Vehicle capacities
  - Driver specialties
  - Work breaks
  - Time windows on orders
Using Vehicle Routing Problem service

- Currently not available as an analysis tool in ArcGIS.com map viewer
- Download free Route Planner application
- Use SolveVehicleRoutingProblem geoprocessing tool
Schedule deliveries

Schedule deliveries for orders using a fleet of vehicles
Traffic service

• Visualize traffic speeds
  - Support for live, historical and predictive traffic conditions
• Traffic Incidents
• Background layer to display results from network analysis services
• Data updated every five minutes
Using Traffic service

- Use the **World Traffic web map** or add Traffic layer to your own web map

- Use traffic map service in ArcGIS for Desktop
Understanding Your Bill – Service Credits

• Every successful request deducts credits from your organization

• How many service credits does network analysis use?

<table>
<thead>
<tr>
<th>Network Analysis</th>
<th>Credits Used</th>
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<tbody>
<tr>
<td>Simple Routes</td>
<td>0.04 credits per route</td>
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<tr>
<td>Optimized Routes</td>
<td>0.5 credits per optimized route</td>
</tr>
<tr>
<td>Drive Time (Service Areas)</td>
<td>0.5 credits per drive time</td>
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<tr>
<td>Closest Facilities</td>
<td>0.5 credits per closest facility</td>
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<tr>
<td>Multi-Vehicle Routes( VRP)</td>
<td>2 credits per route</td>
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<tr>
<td>Traffic</td>
<td>0 credits</td>
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</table>

• Credits Explained
Monitor service credits used by your organization

- Reports can be accessed by the administrators in your ArcGIS Online organization
On-premise services
On-premise service workflow

Author GIS Resources

Publish GIS Services

Use GIS Services
Network analysis using on-premise services

**ArcGIS for Server**

- Geoprocessing Service
  - A toolbox with geoprocessing tools
  - Full use of the geoprocessing framework
  - Synchronous and Asynchronous execution
  - SOAP and REST endpoints for all solvers
  - Out-of-the-box clients

- Network Analysis Service
  - Map document with network analysis layers
  - Synchronous execution
  - SOAP endpoints for all solvers
  - REST endpoint for Route, Closest Facility, and Service Area Area solvers
  - Few out-of-the-box clients
On-premise services

- More details about authoring, publishing and using on-premise network analysis services are available in technical workshop titled Performing Network Analysis with ArcGIS for Server from 2012 user conference
  - Workshop presentation
  - Workshop video

- Applicable for ArcGIS for Server 10.1 and 10.2
Need to use on-premise services if

- Perform analysis on the network dataset managed by you
- You cannot connect to the internet due to your organizational policies
- You need to use transportation modes other than driving such as transit or walking
- Your area of interest is not covered by online services
Indoor routing
UC2013 indoor navigation app
Hybrid services
Hybrid services

- Some workflows can require online as well as on-premise services

- For example, automatic vehicle location (AVL) and dispatch
Find nearest police cruisers

Find three closest police cruisers from an incident location
Summary
Summary

• Online services
  - Ready-to-use services provided by Esri
  - Requires internet connection
  - Requires ArcGIS Online subscription
  - Cannot use your own street data

• On-premise services
  - Requires hardware and ArcGIS software
  - Have to use your own street data modeled as a network dataset
Resources
Support and Resources

- http://logistics.arcgis.com
- http://route.arcgis.com
- http://traffic.arcgis.com
- http://developers.arcgis.com
- Sample applications
- ArcGIS Online services in the Network Analyst help
Network Analyst at the User’s Conference
# Network Analyst team presentations

<table>
<thead>
<tr>
<th>Time</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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</thead>
<tbody>
<tr>
<td>8:30 am</td>
<td>Network Analyst: An Introduction</td>
<td>Network Analyst: Network Analysis with ArcGIS Online and On-premise Services</td>
<td>Designing your Network Analyst Workflow</td>
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<tr>
<td>9 am</td>
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<td>Network Analyst: Creating Network Datasets</td>
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<tr>
<td>10 am</td>
<td>Network Analyst: Performing Network Analysis</td>
<td>Network Analyst: Automating Workflows with Geoprocessing</td>
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<td>12 pm</td>
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<td>Network Analyst: Routing and Directions using Data and Services on ArcGIS Online</td>
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<td>1 pm</td>
<td>Network Analyst: How to Route Inside and Between Buildings Using 3D Network Capabilities</td>
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<td>Network Analyst: How to Build Efficient Vehicle Routes that Improve Cost and Customer Satisfaction Using Network Analyst</td>
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<td>Network Analyst: Creating Network Datasets</td>
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<td>4 pm</td>
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<td>Real-time Traffic and Other New Capabilities of Network Analysis</td>
<td>Designing your Network Analyst Workflow</td>
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<td>8:30 am</td>
<td><strong>Transportation Network Analysis and Planning</strong></td>
<td>Multi-Modal Transportation and Logistics: Leading Examples</td>
<td>Esri &amp; OpenStreetMap: Tools, Apps, Maps!</td>
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<tr>
<td>9 am</td>
<td>Room 26 B</td>
<td>Room 28 E</td>
<td>Hall G: Room 2</td>
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<tr>
<td>10 am</td>
<td><strong>Electric Vehicles: GIS for EV Infrastructure</strong></td>
<td><strong>Transportation Planning for Rural Areas</strong></td>
<td><strong>Using Streetmap Premium</strong></td>
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<tr>
<td></td>
<td>Room 29 A/B</td>
<td>Room 26 B</td>
<td>Hall G: Room 2</td>
</tr>
<tr>
<td>11 am</td>
<td><strong>ArcGIS GeoEvent processor for Server - Monitoring Routes</strong></td>
<td><strong>Public Transit: Accessibility and Land Use</strong></td>
<td><strong>Online GIS Exhibit Hall C</strong></td>
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<td>Room 30 B</td>
<td>Room 31 B</td>
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<td>12 pm</td>
<td><strong>Customer and Route Optimization in Public Works</strong></td>
<td><strong>Indoor Location, Tracking, and Routing</strong></td>
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<tr>
<td>1 pm</td>
<td><strong>Public Transit: Accessibility and Land Use</strong></td>
<td><strong>Facilities and Real Property Management</strong></td>
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<td>2 pm</td>
<td><strong>Pedestrian Routing, Transit, and Tolls</strong></td>
<td><strong>GIS for Non-Motorized Transport</strong></td>
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Thank you…

Please fill out the session evaluation

First Offering ID:  1271
Second Offering ID:  1374

Online – www.esri.com/ucsessionsurveys
Paper – pick up and put in drop box