Utility Network Management In ArcGIS: Introduction to the Utility Network

Hussein Nasser, Remi Myers
Core team of Superusers and Analysis provide backbone

- Generate Asset Management Solutions
- Support Operations
- System of Record
- Strong Location and Navigation Support
- Restoration

Challenges:

- Learning curve for non-GIS users
- Extending the ROI of spatial knowledge
- Robust technology for data science and analytics.
Utility network vision

- Provide utility customers with the ability to model, edit, and analyze complex networks of facility infrastructure using all Esri platform clients
- Enable key modeling concepts to better support a true representation of what is on the ground, while fostering an easy exchange of network information with other mission critical systems
- Provide network management solutions for next 15+ years
Regulatory and market drivers are changing the utility industry
Ensuring data quality and correctness

- Quality of data becoming increasingly important to drive smart grid and external systems
- Reduce common data collection errors through:
  - Feature placement based on predefined patterns
  - Automated snapping based on connectivity rules
Utility network management

Real world representation of what is on the ground
- Accurately representing assets for enhancing analysis and modeling
- Device Assembly – A container for multiple devices
- Linear containment – Trenches/Ducts contain wires
- Rich analytical solutions
- Capable of extension by partners
Utility network management

Improved performance and scalability
- Foundation solution for engagement across your enterprise
- Adaptive to your data needs and regulatory changes
- Optimized user experience with focused tools and solutions
Overview of the Network
Hussein Nasser
Network Rules, Attribute Rules, Contingent Attribute Values

Remi Myers
Connectivity associations

- Traditional Connectivity required equipment to be collocated with the line
- Connectivity associations enable offset features to be connected

Junction – Junction
Junction – Edge
Edge - Junction - Edge
Network containment associations

Value of Container Associations

- Enables features to be compressed or contained in objects such as vaults or pumphouses
- Containment associations can be supported on point, line, and polygon features
Value of Attachments

- Structural attachment associations are used to model the associations between devices.

- Structural attachment capabilities are specified at the asset type level.
  - Structural attachment rules are used to constrain what may be attached to what.
Attribute rules

- **Calculation rules**
  - Populate attributes based upon other attributes on a single feature or other related feature

- **Constraint rules**
  - Specify permissible attribute configurations on a feature; when the constraint rule is violated, an error is raised

- **Validation rules**
  - Checked during a batch validation process
  - When the validation rule is violated, an error feature is created (similar to Topology)
  - Business rules that can be temporarily violated

- **Session rules**
  - Attribute values that are specified once during an edit session
  - (e.g., work order) are applied to features that share the rules
  - Automatic default value setting mechanism
Exploring Rules
Hussein Nasser
Subnetworks, Controllers, Traces

Remi Myers
Leveraging subnetworks

- Topological subset that represents circuit or feeder
- Logical representation of all of the devices, linear assets and facilities that make up your network.
- Is capable of calculating and aggregating identified “network attributes” such as pressure, or load.
- It can also count devices or customers participating in the circuit or feeder
Configuring controllers

- Controllers are designated devices that identify the origin of the network
- Utilize the terminal configuration for controller orientation.
- Can be configured as sources or syncs based upon domain configuration
- Determine the feeder/circuit name.
Network attributes

- Properties of the network elements that control traversability
- Can have name, unit, data type, or usage type properties.
- Units of a cost attribute can be things like distance, time, or other type units such as voltage, volume, or load.
Subnetwork Management
Hussein Nasser
### Network Management With ArcGIS Road Ahead

**July 2019**

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<thead>
<tr>
<th>10.7/2.3</th>
<th>10.7.1/2.4</th>
<th>Near term</th>
<th>Mid to Long term</th>
</tr>
</thead>
<tbody>
<tr>
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<td>▪ Tracing Framework Updates (Loop management, etc.)</td>
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## Learn and Do More....

<table>
<thead>
<tr>
<th>Session</th>
<th>Location</th>
<th>Time Frame</th>
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<tbody>
<tr>
<td>Tracing Utility Networks over the Web</td>
<td>Demo Theater</td>
<td>1:00-2:00 Tuesday</td>
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<tr>
<td>Utility network- How utilities are migrating</td>
<td>Room 26B</td>
<td>2:30-3:30 Tuesday</td>
</tr>
<tr>
<td>ArcGIS Solutions for Electric Utilities</td>
<td>Room 30B</td>
<td>8:30-9:30 Wednesday</td>
</tr>
<tr>
<td>Migrating Data into the Utility Network</td>
<td>Room 30C</td>
<td>1:00-2:00 Wednesday</td>
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<tr>
<td>Utility Network in ArcGIS – Advanced</td>
<td>Room 7A/B</td>
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