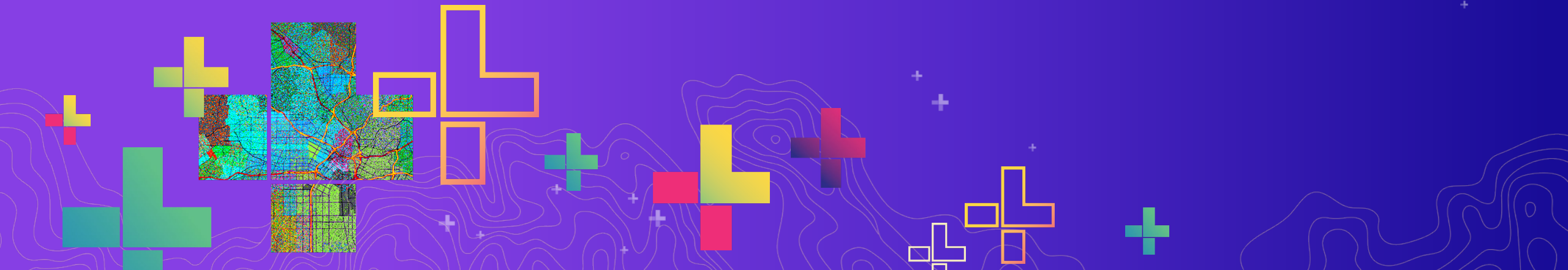


# Network Management with ArcGIS – Introduction to the Utility Network

Hussein Nasser, Remi Myers

2020 ESRI DEVELOPER CONFERENCE | Palm Springs, CA



# Session Overview

- Topics –
  - Architecture and new license model
  - Network & Attribute rules, popups, and network management using Arcade
  - Tracing and new upcoming features

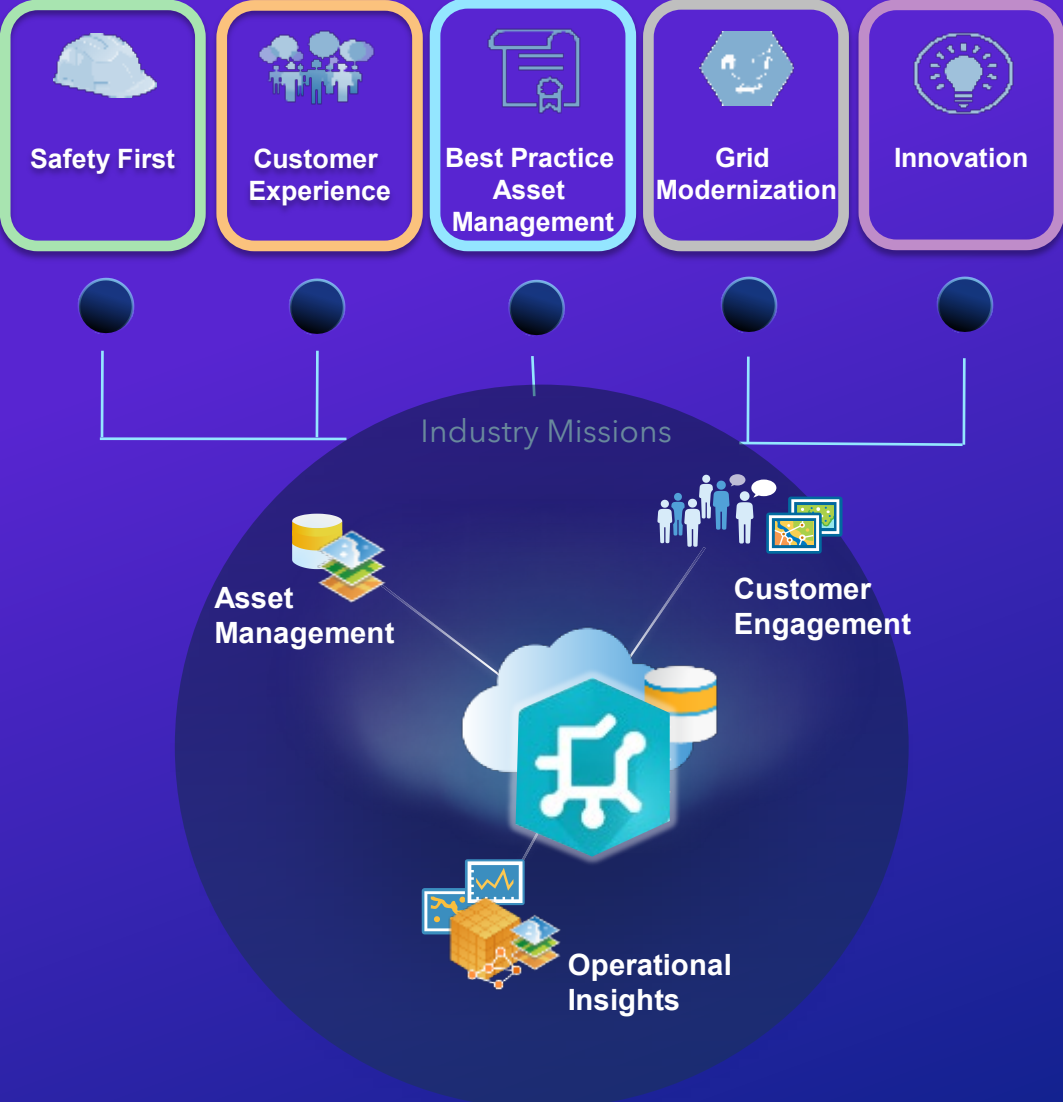




# Introduction and User Type Licensing



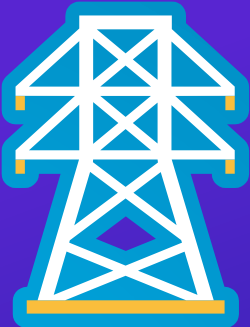
# ArcGIS | Common utility business drivers





Operational Commodities are Expressed as **Domains**

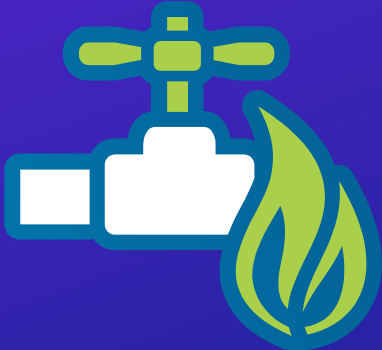
Electric



Telco



Gas



Water





## All Utility Network Configurations have Structural Domains

### Junctions

- Poles
- Manholes
- Vaults
- Frames
- Platforms



### Lines

- Ducts
- Trenches
- Guys
- Shield Wire



### Boundaries

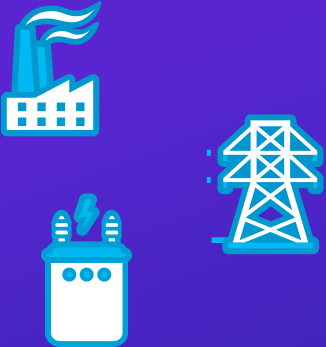
- Pump House
- Substation
- Maintenance Area
- Facility





The Business is Expressed as **Tiers**

## Electric



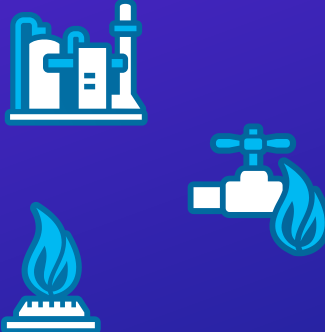
Generation  
Transmission  
Distribution

## Telco



Wireless  
Fiber  
Cable

## Gas



Gathering Zones  
Pressure Zones  
Isolation Zones

## Water



Storage  
District Network  
Service Pipes



# Software demonstration

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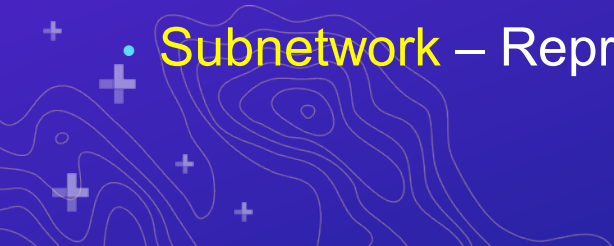






## Tiers Have Specific Feature **Layers** – All Have Connectivity

- **Devices** – Represent Operational Features such as Switches, Valves, Transformers, Pumps
- **Junctions** – Represent Non-Operational Connection Points such as Taps and Tees
- **Assemblies** – Represent a Collection or Container of Devices such as Switch Gear
- **Lines** – Represent Linear Connective Assets such as Wires, or Pipes
- **Subnetwork** – Represents the Operational Properties of All of the Above for a Single Network





For Each Feature Layer **Asset Groups** Provide General Descriptions

- Devices – **Switches, Valves, Transformers, Pumps**
- Junctions – **Connection Points**
- Assemblies – **Transformer Bank, Pump Assembly**
- Lines – **Medium Voltage, Low Voltage, High Pressure, Low Pressure**



For Each Feature Layer **Asset Types** Provide Specific Descriptions

- Devices – Switch/**Three Phase Disconnect**, Valve/**One Way**
- Junctions – Connection Point/**Tap**
- Assemblies – Transformer Bank/**Three Phase Delta**, Pump Assembly/**Town station**
- Lines – Medium Voltage/**Single Phase**, Low Pressure/**Service**



# Software demonstration

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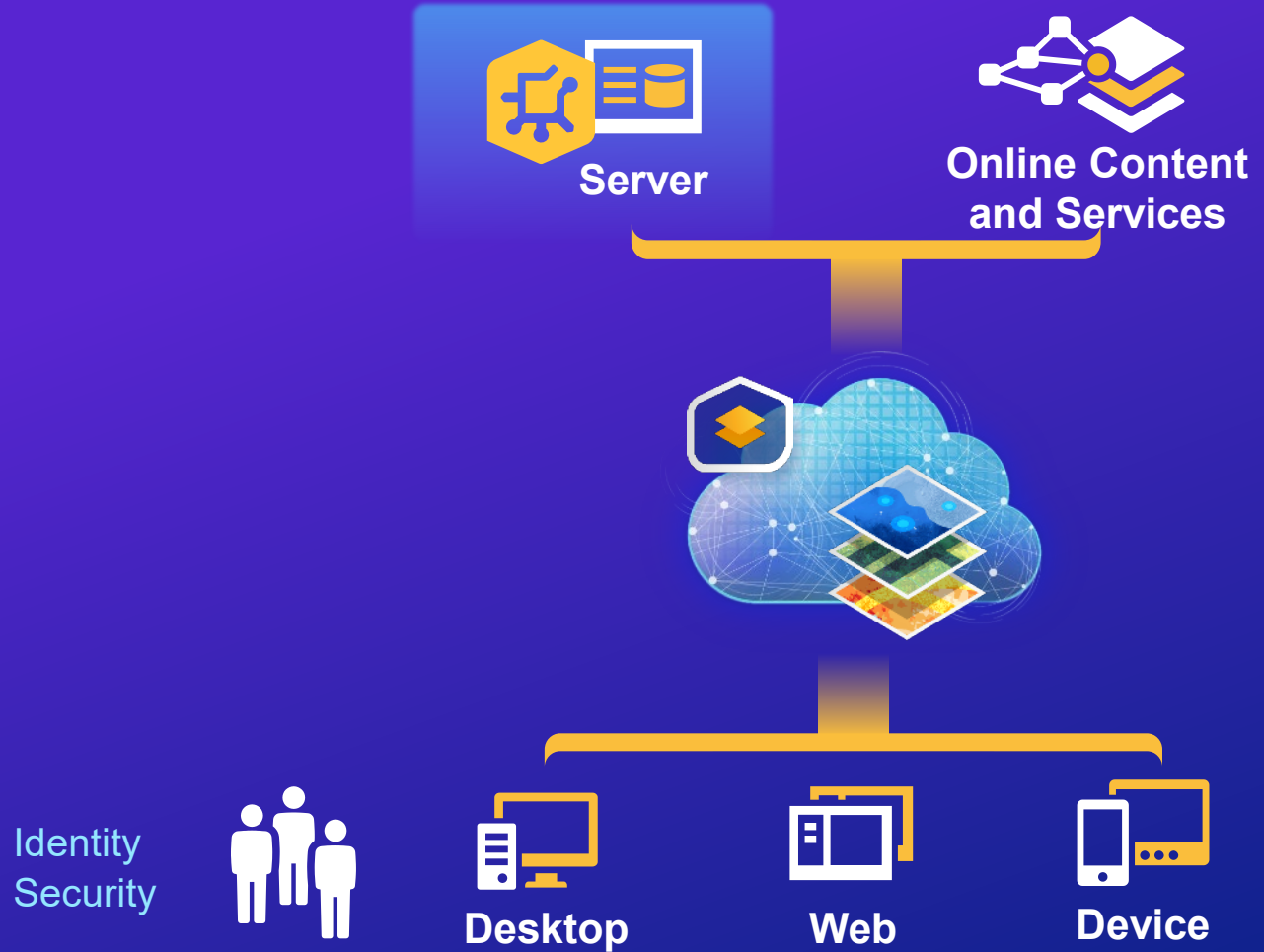


# ArcGIS Utility Network User Type extension



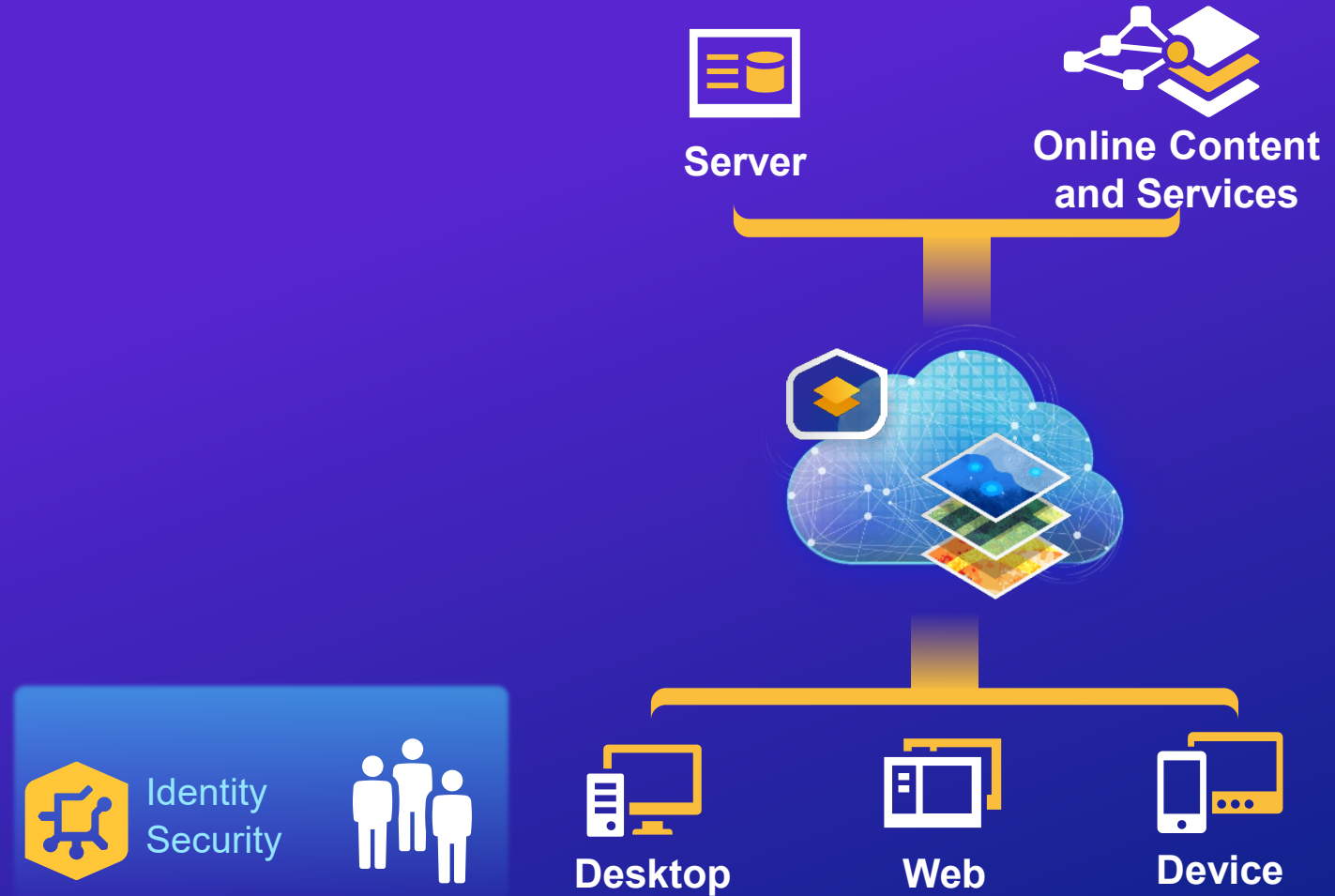
# Utility Network Management Extension Today 10.7.x

- What License is Needed:
  - User Type
  - Enterprise license
  - Utility Network Server Extension



# Utility Network Management Extension 10.8 and beyond

- What License is Needed:
  - User Type & Extension
  - Enterprise license
  - ~~Utility Network Server Extension~~



# What Happens Without an ArcGIS Utility Network Extension?



Any User Type

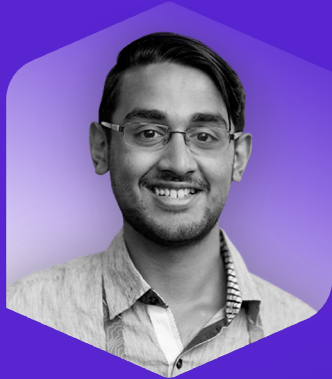
No User Type Extension

Can view, query, or select network features.  
Can view associations to include connectivity,  
containment and structure via attributes\*

- In Runtime 100.7 Associations cannot be viewed without the Extension



# Available Features using the ArcGIS Utility Network



Viewer

Add-on  
(Utility Network only)

Perform traces and display stored network diagrams



Editor

Add-on

Do everything except publish and administer utility network services



Field Worker

Add-on

Do everything except publish and administer utility network services



Creator

Add-on

Do everything



GIS Professional

Add-on  
(Basic)

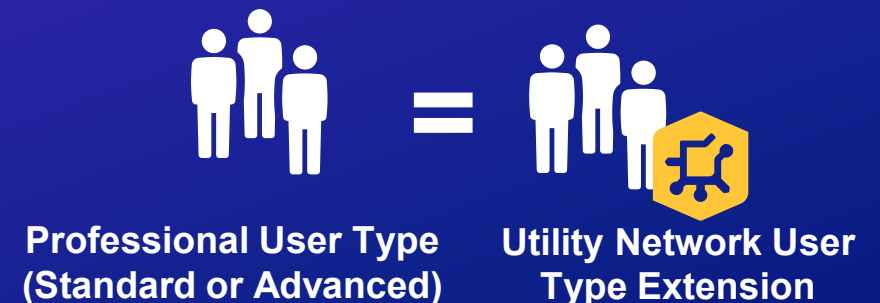
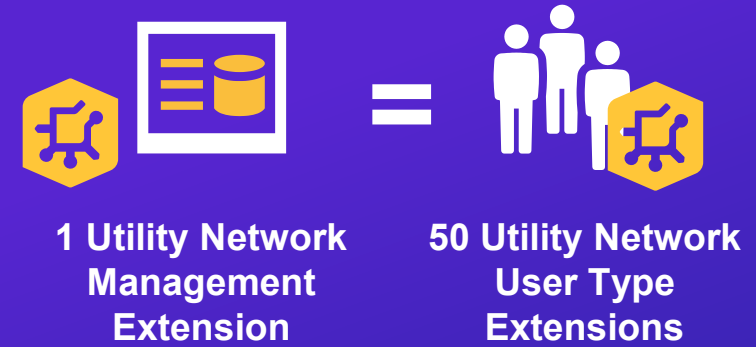
Included  
(Standard & Advanced)

Do everything



# Moving to ArcGIS Enterprise 10.8

- For each 4-core Utility Network Management Extension, you receive 50 Utility Network User Type Extensions
- For each ArcGIS Desktop license, it includes 1 Utility Network User Type Extension
- Purchase Professional User Type (Standard or Advanced)
- Purchase Utility Network User Type Extension



# Software demonstration

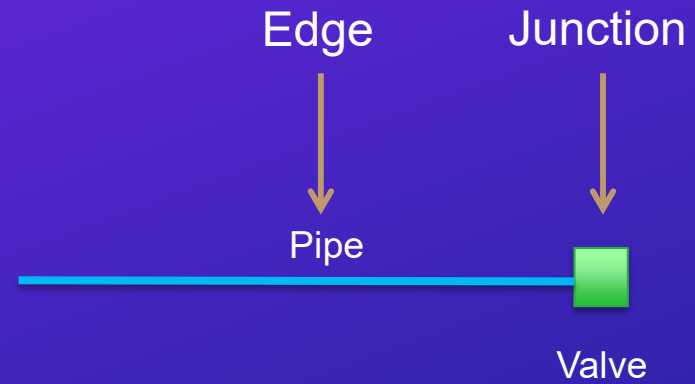
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# Network & Attribute rules, popups and network management using Arcade



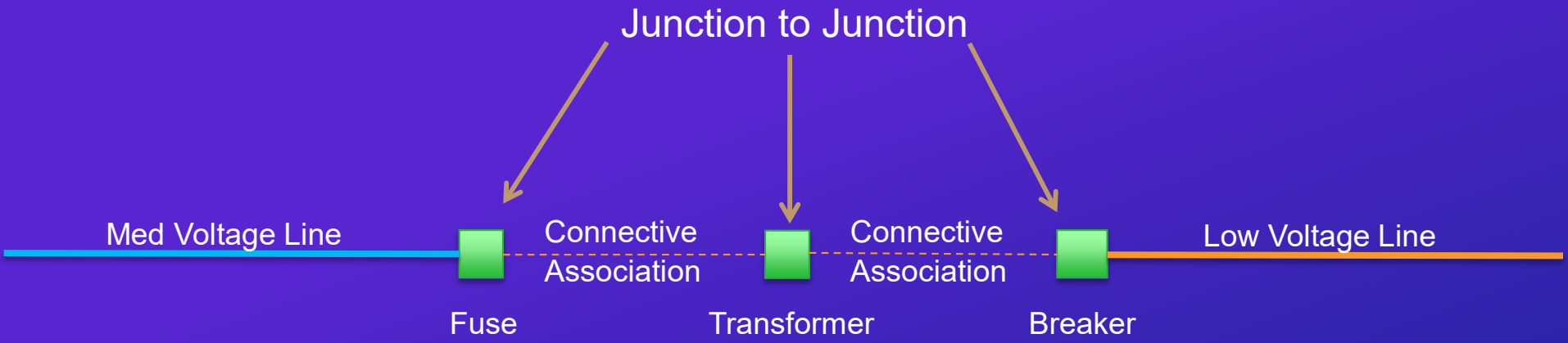
## Edge (Line) to Junction (Point) Rule Type



# ArcGIS | Network Rules

Connective - Electric

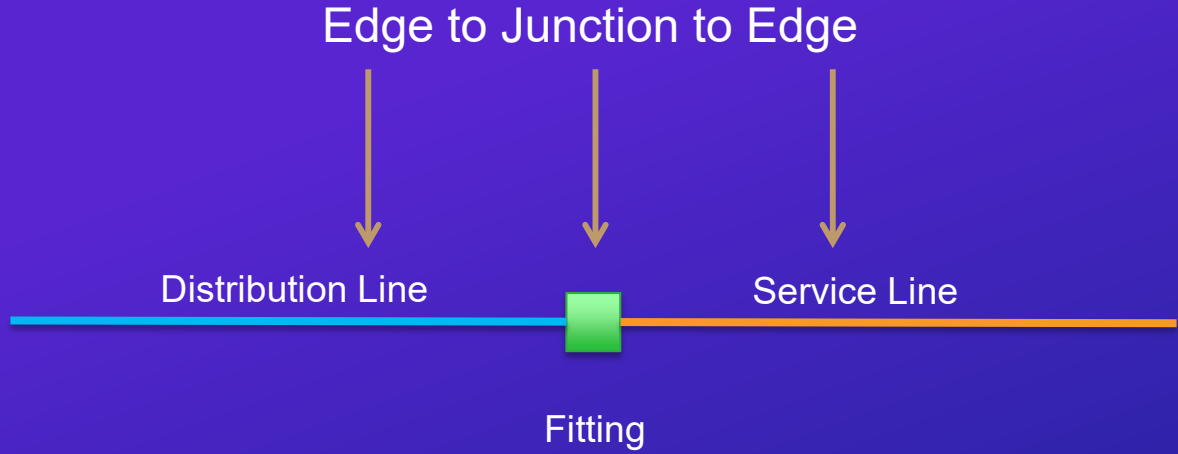
## Junction (Point) to Junction (Point) Rule Type



# ArcGIS | Network Rules

Network Rules - Connective - Pipes

## Edge (Line) to Junction (Point) to Edge (Line) Rule Type

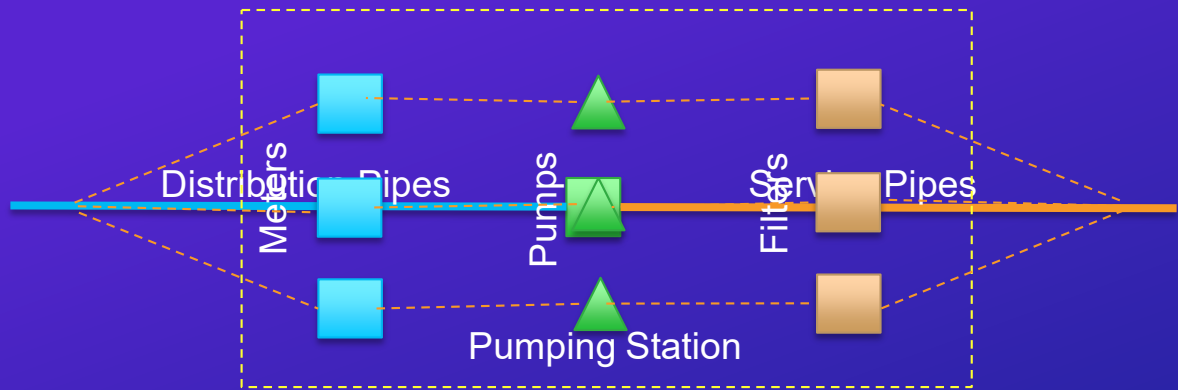


# ArcGIS | Network Rules

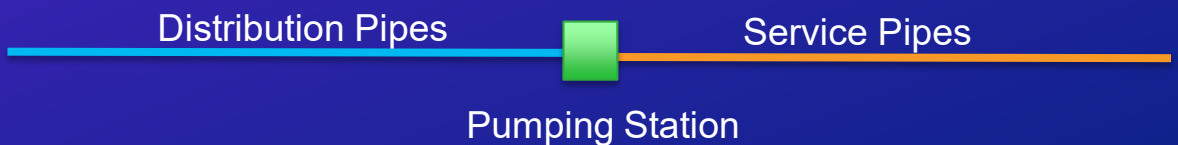
Containment - Pipes

## Containment Rule Type

Containment View/  
Large Scale



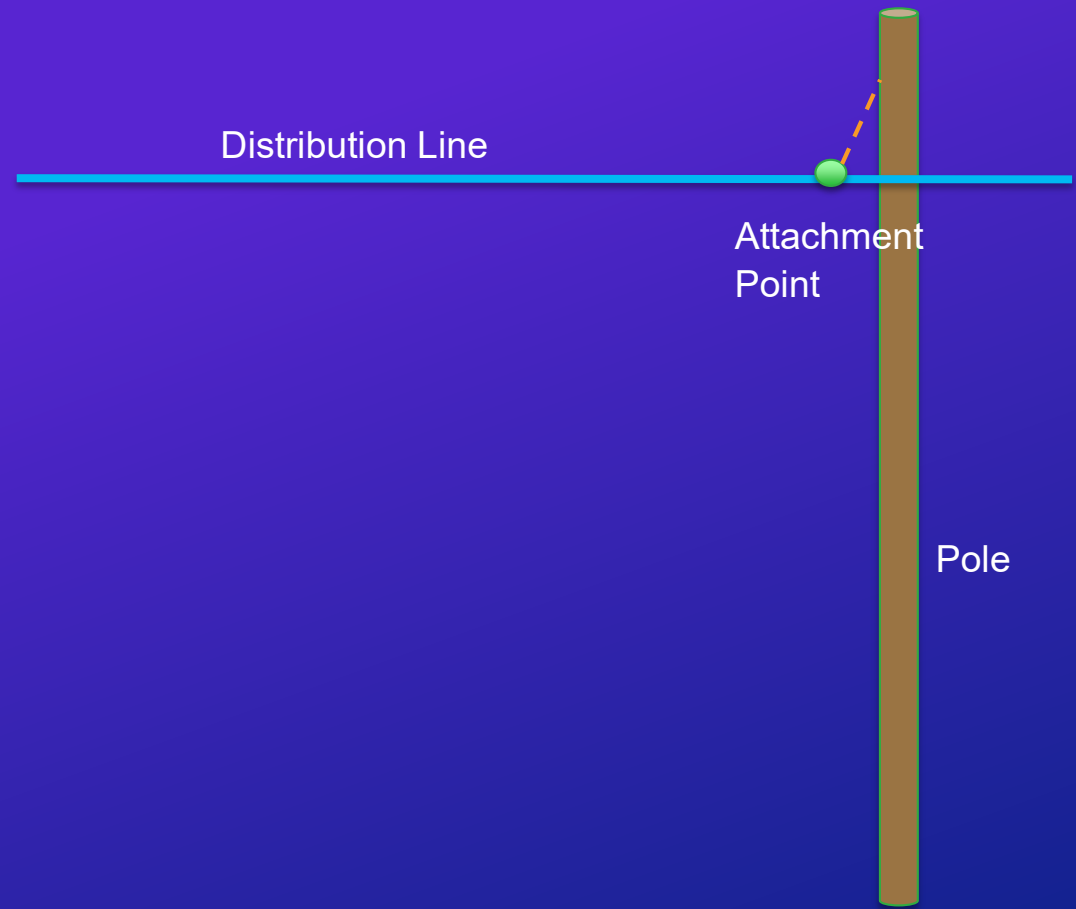
Simple View/ Small  
Scale







## Structural Association Rule Type



# Software demonstration

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# Tracing in the Network



# Exploring Tracing and Network Management

- Elements of Tracing
- Extending Tracing to Web and Runtime
- Optimizing Network Management

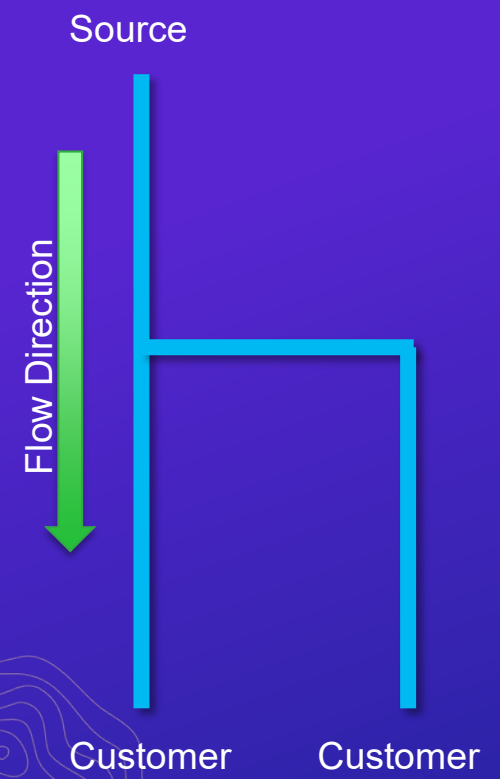


# ArcGIS | Subnetwork Management

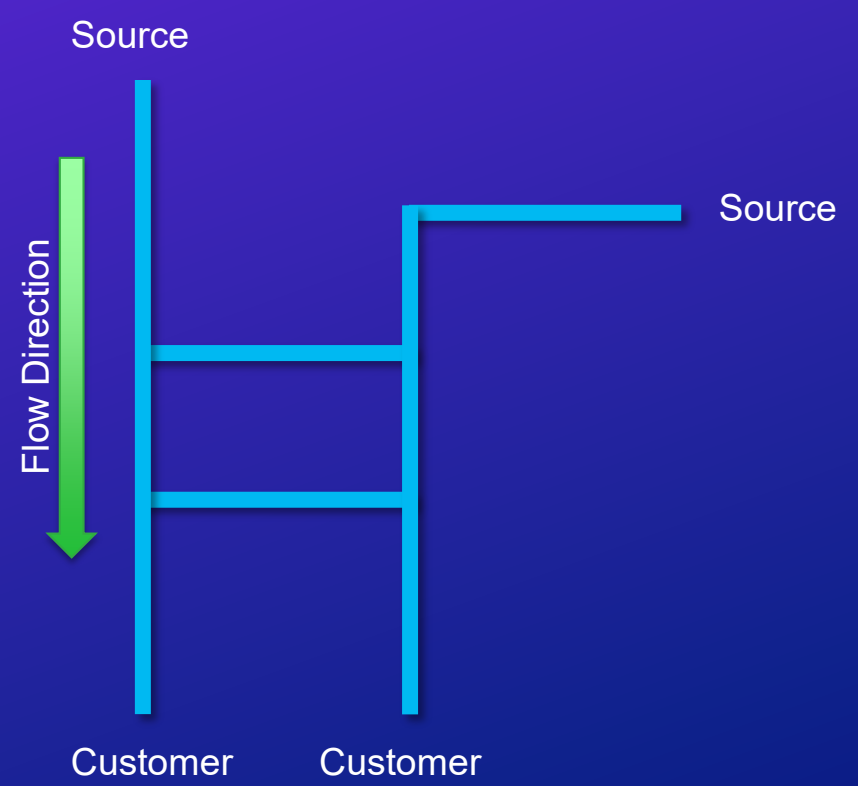
Configurations

## Subnetwork Configuration (Radial vs Mesh)

Radial

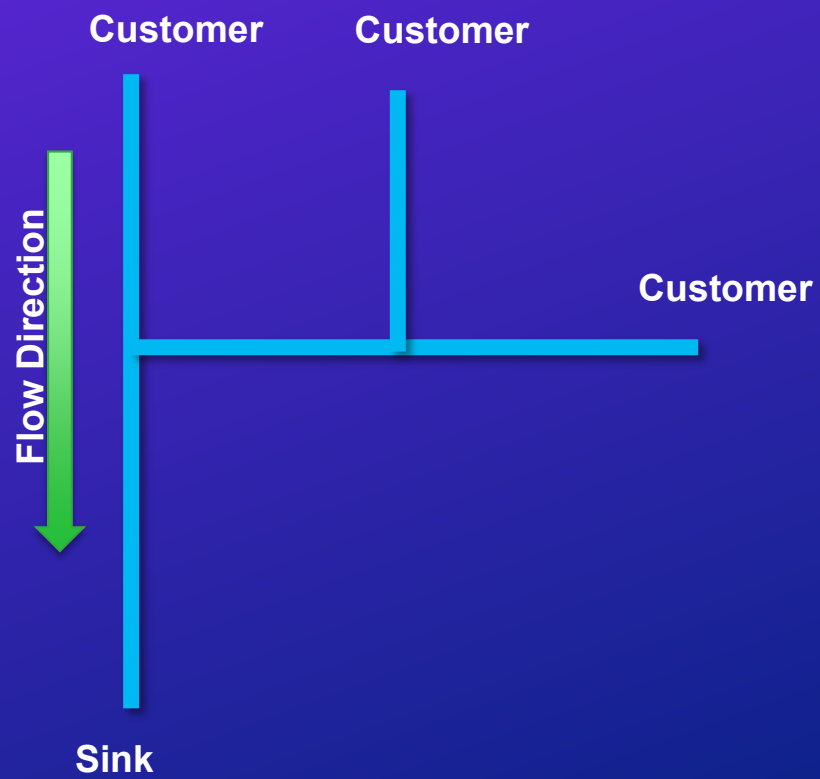
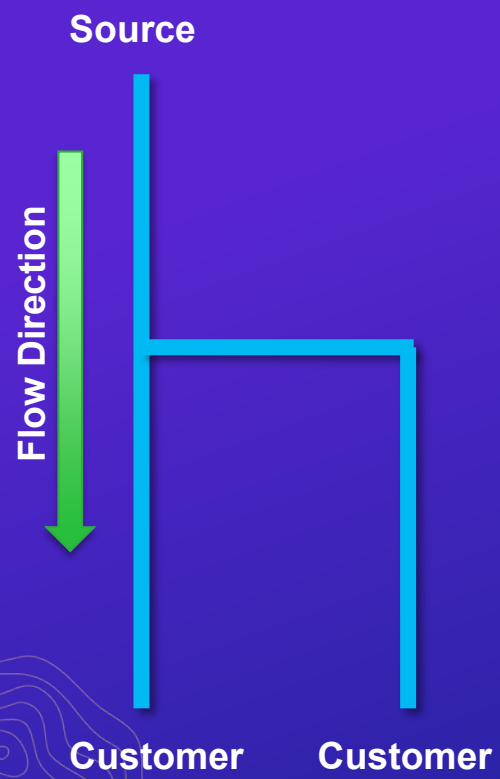


Mesh



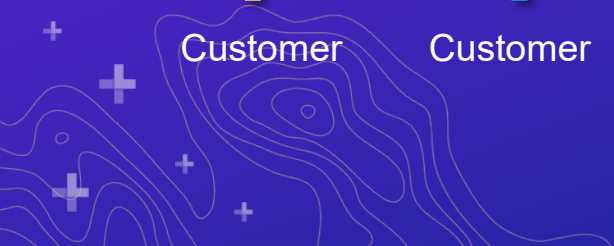
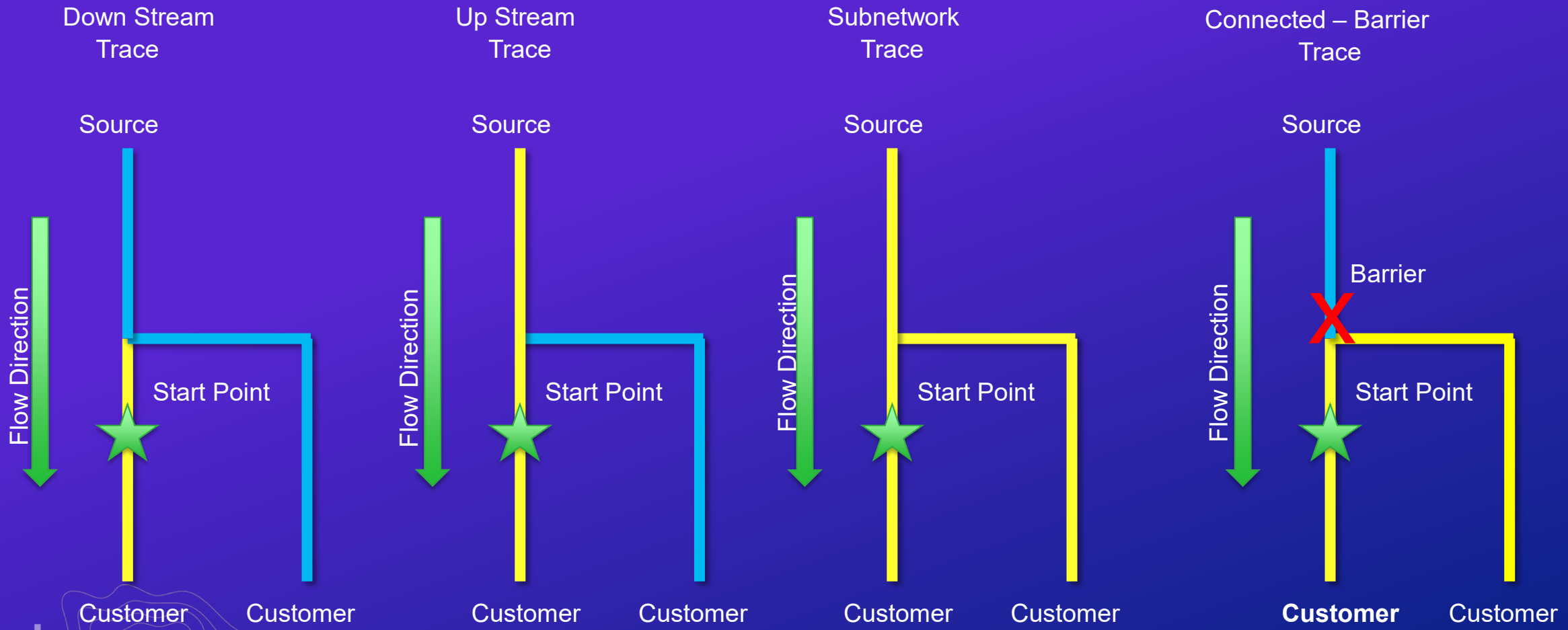


## Subnetwork Configuration (Source vs Sink)



# ArcGIS | Tracing and Diagrams

## Tracing



# Software demonstration

Hussein Nasser





## Training, meetings and conferences

- Live Training Seminar – March 26<sup>th</sup>
- Creating and Managing Utility Networks with ArcGIS (Esri Academy)
- Designing and Configuring Utility Networks with ArcGIS (Esri Academy – This Summer)
- European GeoConX – May 12-14
- Esri User Conference - July 13-17
- GeoConX – October 26-29





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