

# Esri Developer Summit

March 26–29, 2012 | Palm Springs, California

[esri.com/events/devsummit](http://esri.com/events/devsummit)



## Publishing and Using Map Services with ArcGIS 10.1 for Server

Stefan Balbo / Ty Fitzpatrick

Mohammed Hoque / Craig Williams



# Agenda

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- **Publishing and Using Map Services (45 min)**
- *Questions (10 min)*
- **Enhancements for Map Services (15 min)**
- *Questions (5 min)*

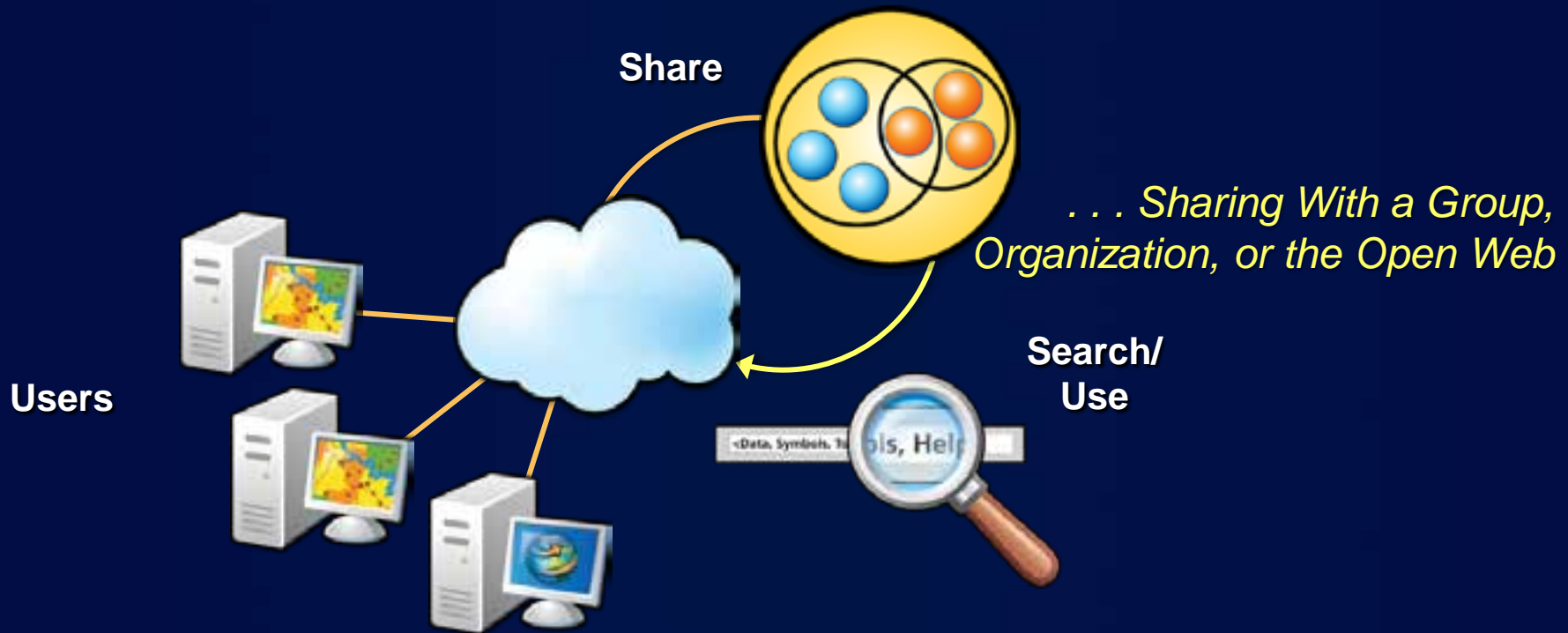
# Publishing and Using Map Services

Stefan Balbo & Ty Fitzpatrick



```
esri.symbol.SimpleLineSymbol,
new dojo.Color([0, 0, 0, 0.5]),
polySymbol,
feature.setSymbol,
} else if(f == 1) {
var polySymbolGreen =
polySymbolGreen.setOutline(
symbol.SimpleLineSymbol(esri.symbol.
Color([0, 0, 0, 0.5]), 1));
polySymbolGreen.setSymbol(polySymbolGreen);
feature.setSymbol(polySymbolGreen);
} else if(f == 2) {
polySymbolBlue = new esri.symbol.SimpleLineSymbol(
new dojo.Color([0, 0, 0, 0.5]), 1);
polySymbolBlue.setSymbol(polySymbolBlue);
feature.setSymbol(polySymbolBlue);
}
```

# Information Sharing is Critical



*Transparency and easy information access are now expected...*

# Sharing as Services

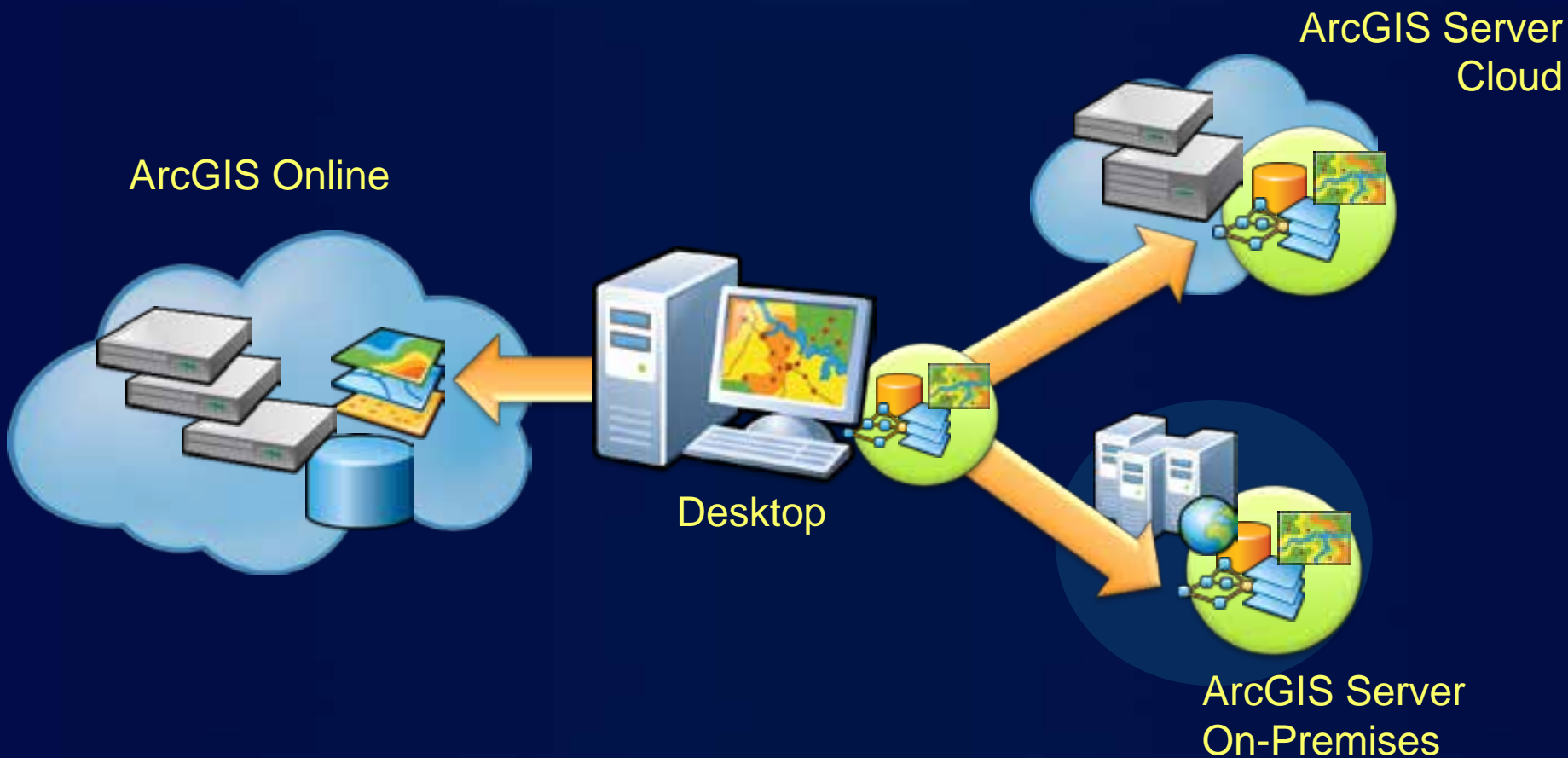
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# Vision

- **Make it easier to share GIS resources**
  - Unified sharing experience
  - Comprehensive Analysis
  - Sharing to servers in the cloud and to ArcGIS Online

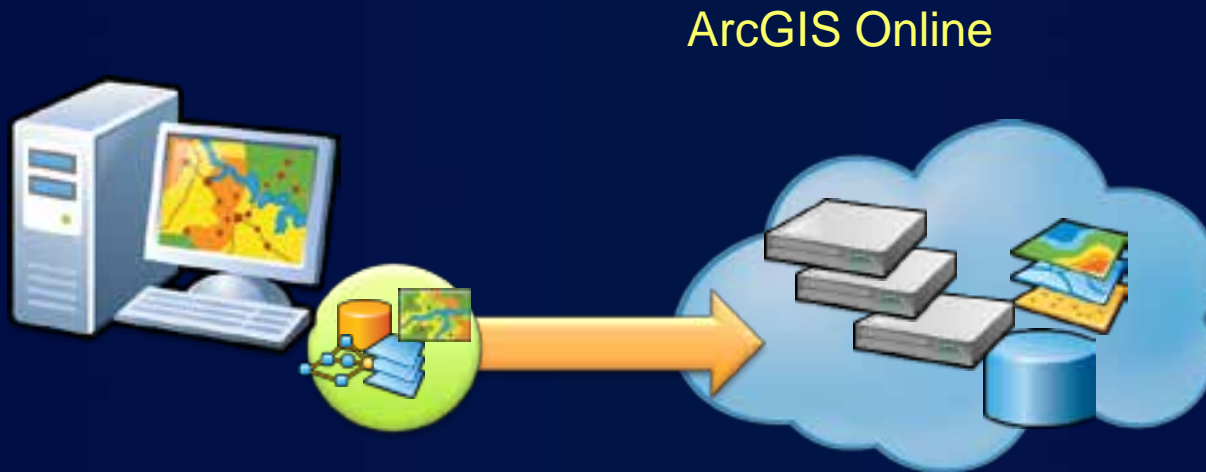


# Sharing as Services

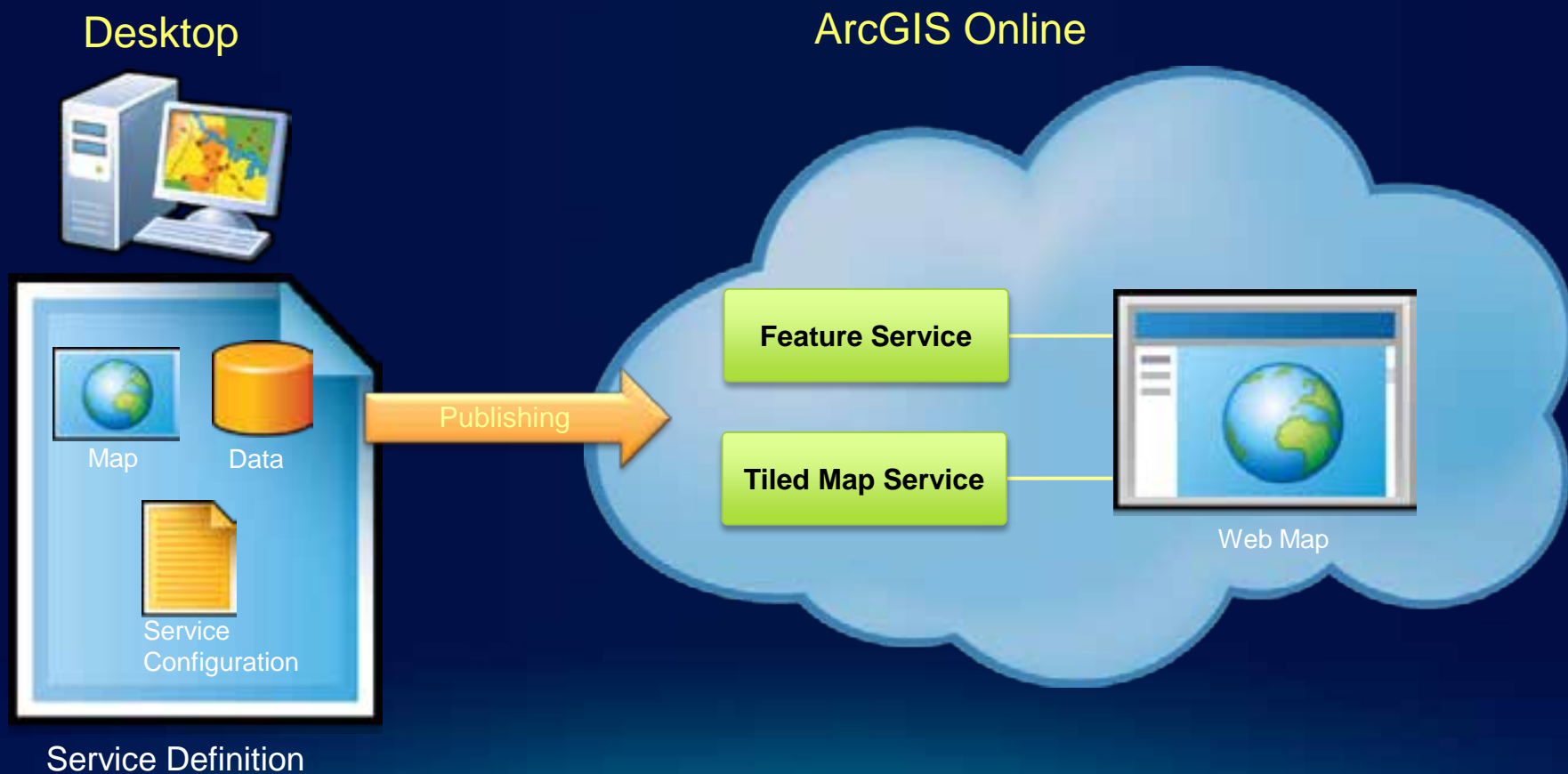


# Demo

## Sharing services as hosted Maps on ArcGIS Online



# Hosted Mapping on ArcGIS Online





# Hosted Mapping on ArcGIS Online

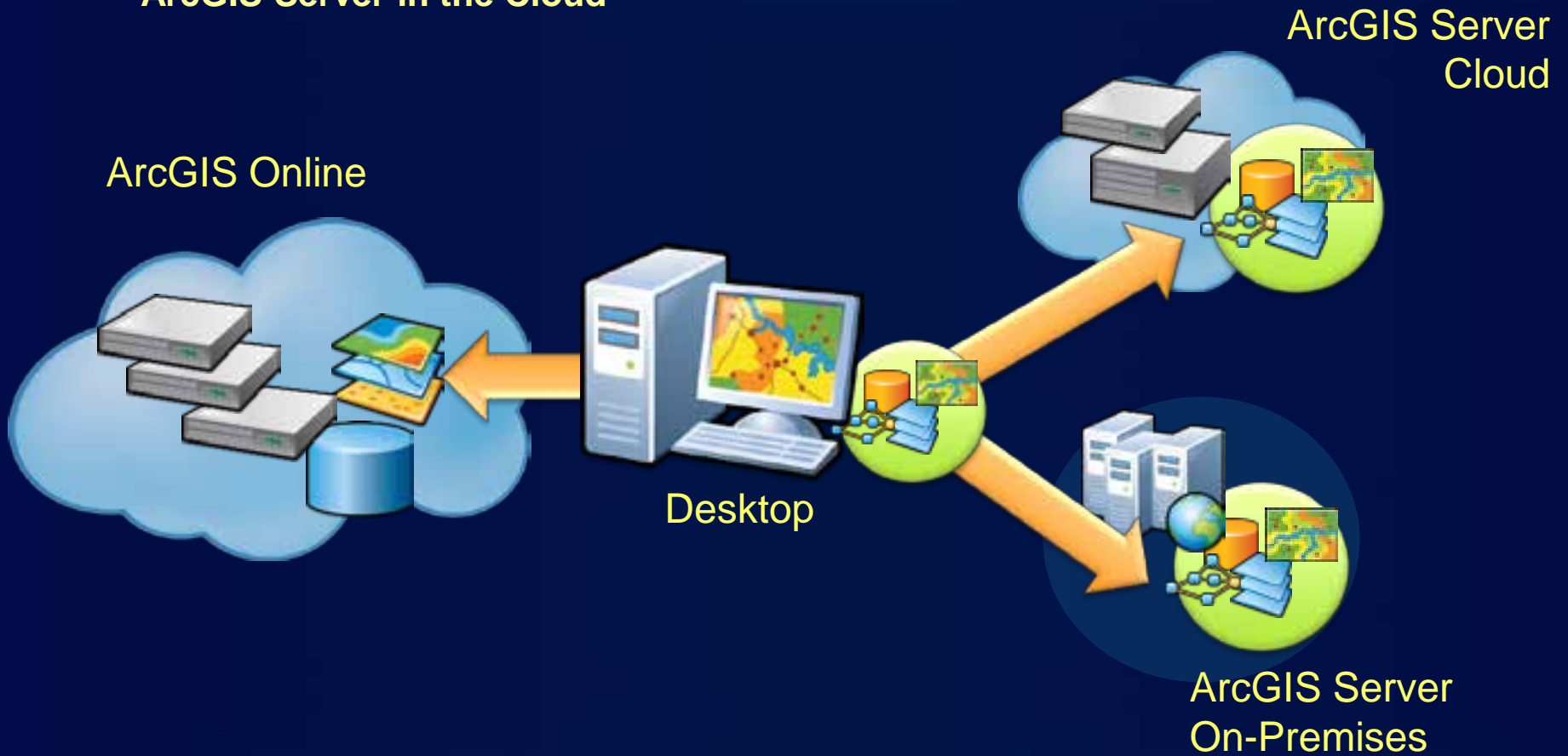
- **Sharing the easy way**
  - No Server to buy, install or maintain
  - Scales automatically
  - No Firewall or IT issues
- **Limitations**
  - Only Tiled Map and Feature Service supported
  - Data is private to each service
- **When to use**
  - Public facing services
  - Desktop Users

## Service Definition (.sd)

- **New file format for publishing in 10.1**
  - Replaces .msd
  - For all services (Map, Geoprocessing, etc.)
- **Contains everything required to create a service:**
  - GIS-Resource (Map, Globe, etc.)
    - embeddable fonts (if needed)
  - Service Configuration
  - Data (if it needs to be copied to the server)
- **Uploaded to the server when publishing**
- **Can be saved and published later**
  - Using Catalog or Server Manager

# Sharing as Services

## ArcGIS Server in the Cloud



# Video

## Sharing services to an ArcGIS Server in the Cloud

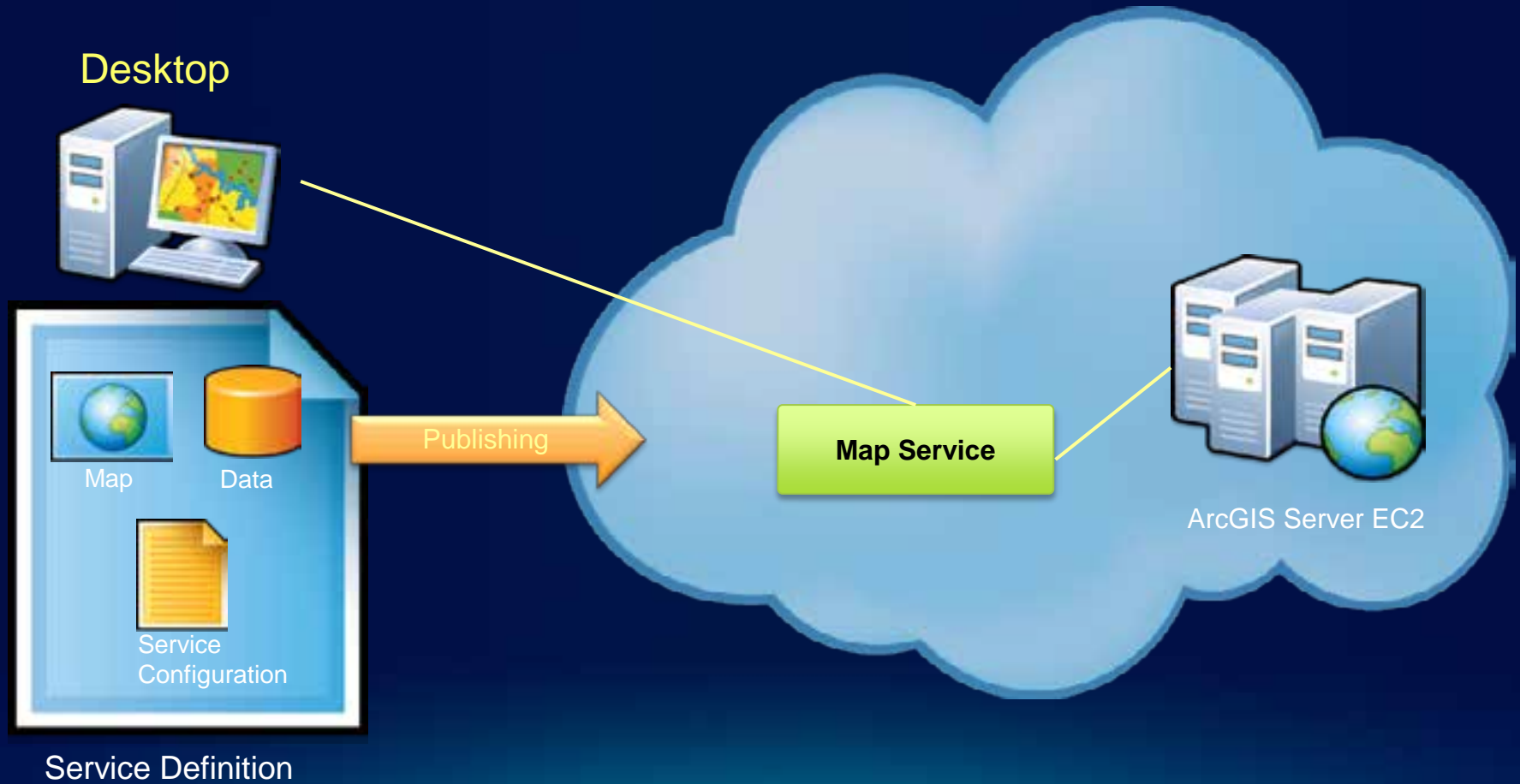


<http://video.arcgis.com/series/40/server>

**Title: Publishing Map Services to ArcGIS for Server with Copying Data**

# ArcGIS Server in the Cloud

## ArcGIS Server in the Cloud

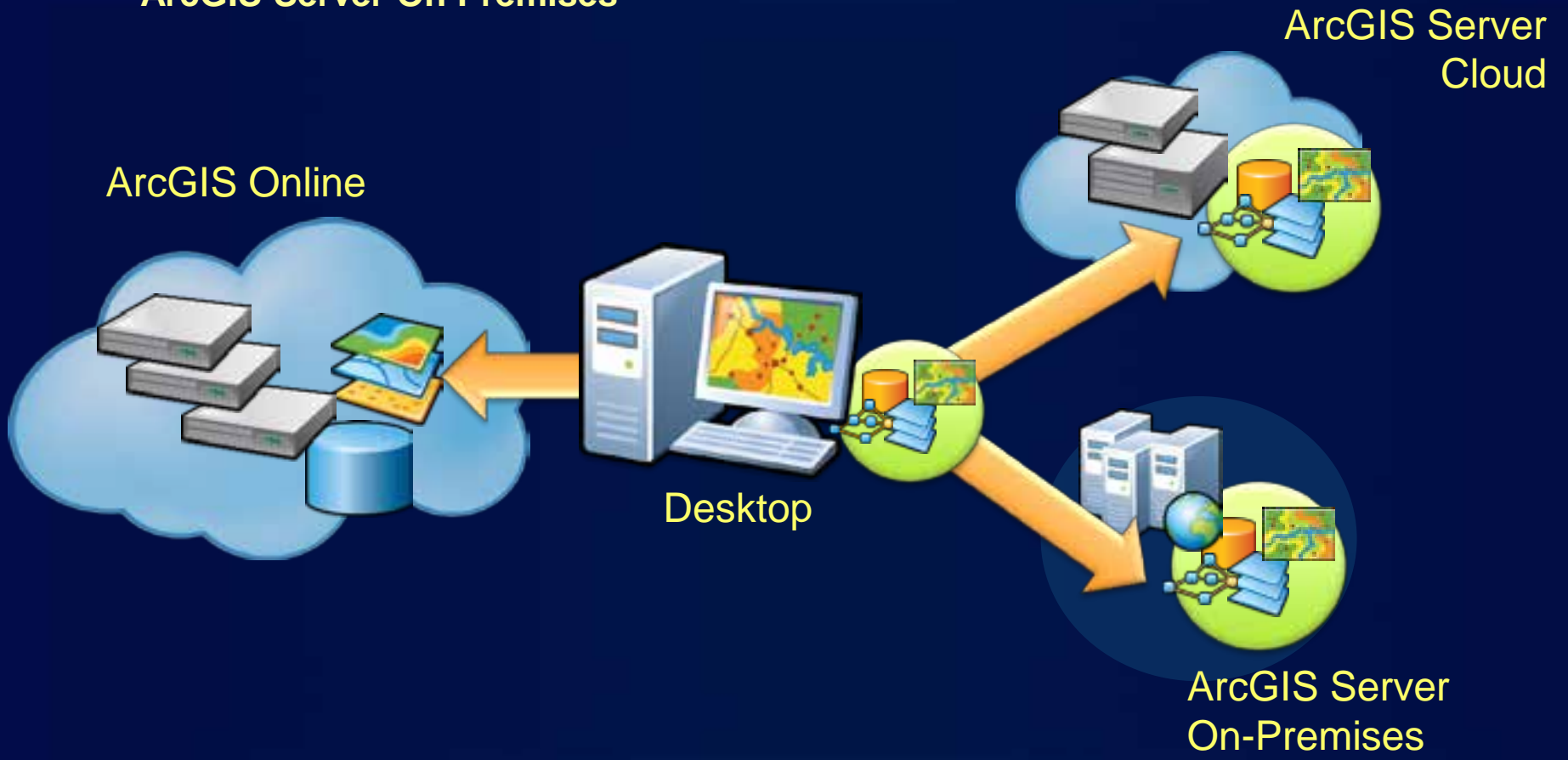


# ArcGIS Server in the Cloud

- **Improvements in 10.1**
  - Simple publishing with copying of data
  - Comprehensive Analysis
- **When to use**
  - Public facing services
  - Need the full functionality of ArcGIS Server

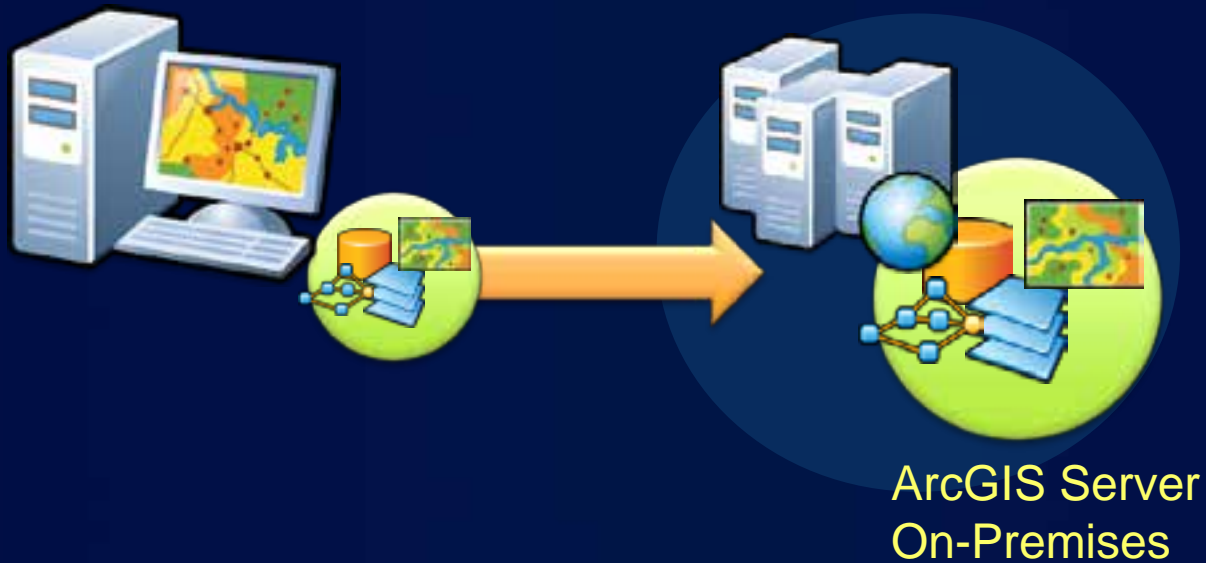
# Sharing as Services

## ArcGIS Server On Premises



# Demo

## Sharing services to an ArcGIS Server in the Enterprise

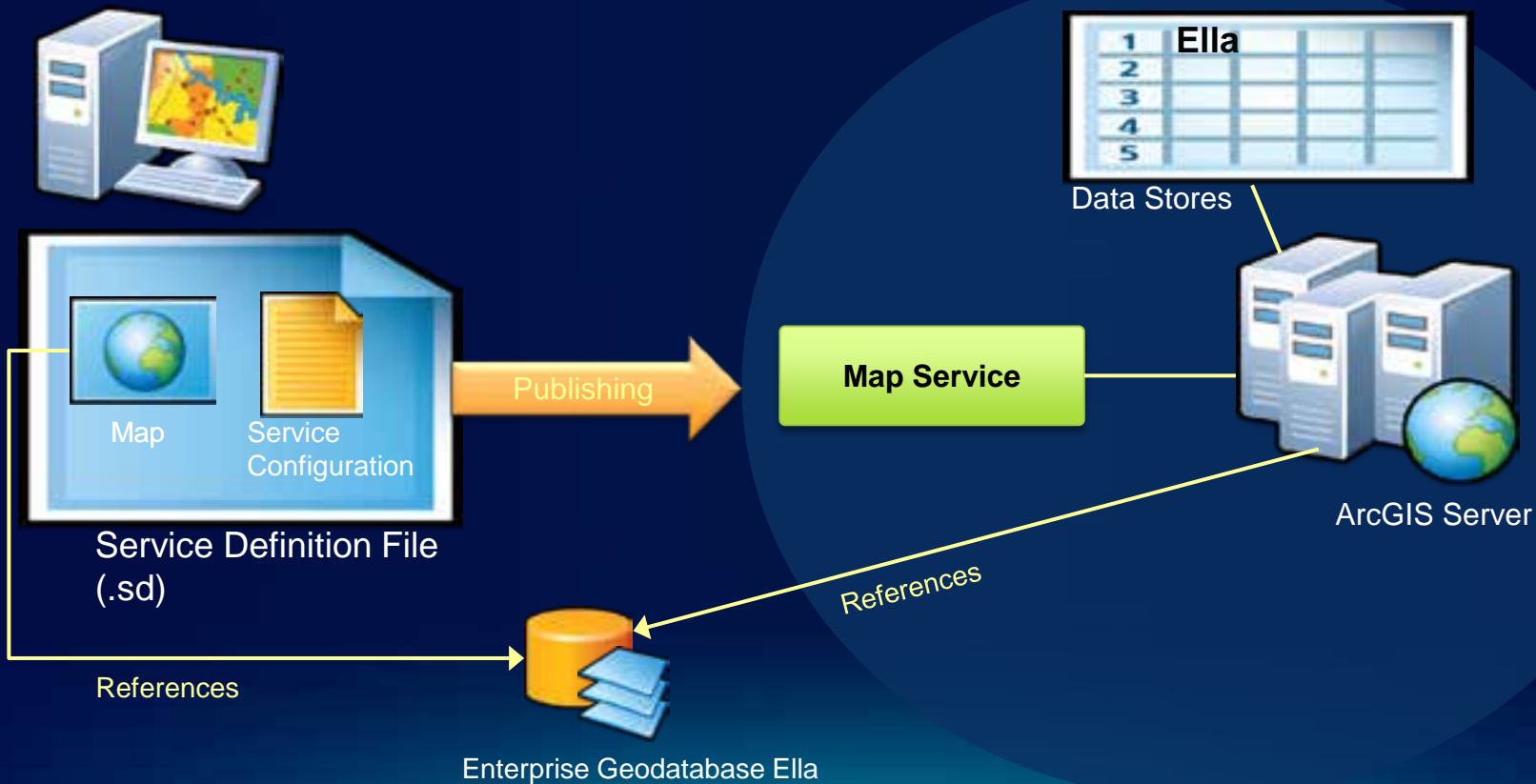




# ArcGIS Server in the Enterprise

Desktop

ArcGIS Server On-Premises



# ArcGIS Server in the Enterprise

- **Improvements in 10.1**
  - Successful publishing to shared data
  - Comprehensive Analysis
  - Simple publishing with copying of data
- **When to use**
  - Need the full functionality of ArcGIS Server
  - Want full control over all hard and software
  - Want to publish services on live, shared data

# Analzyers in 10.1

276 Analyzers total for sharing

• Map Service	133	• GP Service	27
• Feature	22	• Globe Service	5
• Caching	3	• Image Service	5
• Network	13	• Geocode Service	7
• Tracking	6	• Geodata Service	1
• SDS	37		
• Schematics	1	• Packaging	15

*Always publish successfully!*

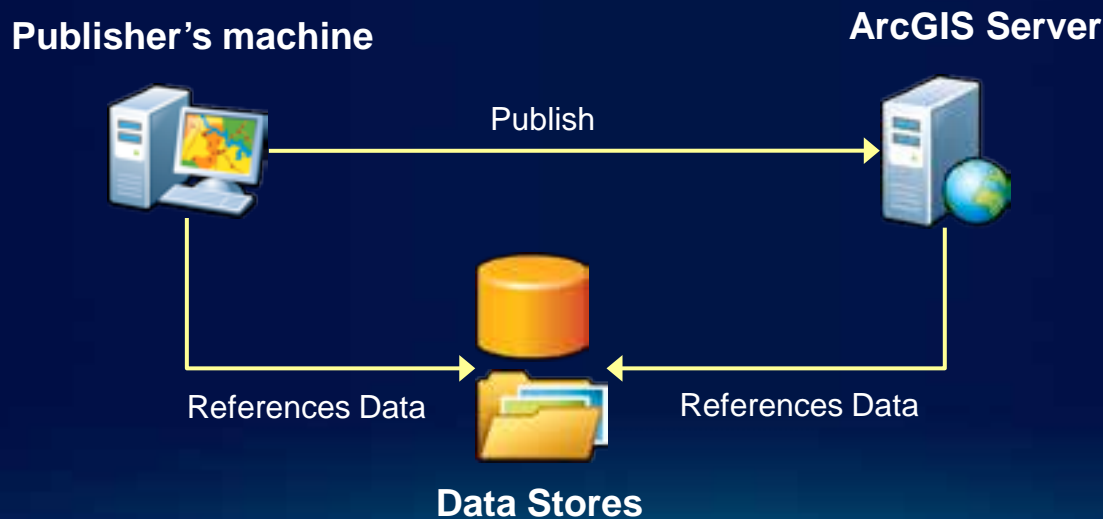
# ArcGIS Server Data Stores

- **Server has a list of registered Data Stores**
- **Data Store is of type**
  - Enterprise Geodatabase
  - Folder
    - **Tip:** register lowest folder level possible for maximal benefit
      - (e.g. register C:\Data\Projects\ Windfarms not C:\Data
- **Access to the Data Store is validated during registration**
  - On all machines in the site
- **Tip:** Read Help Topic “*About registering your data with the server*”

*Data Stores are a key concept for publishing in 10.1*

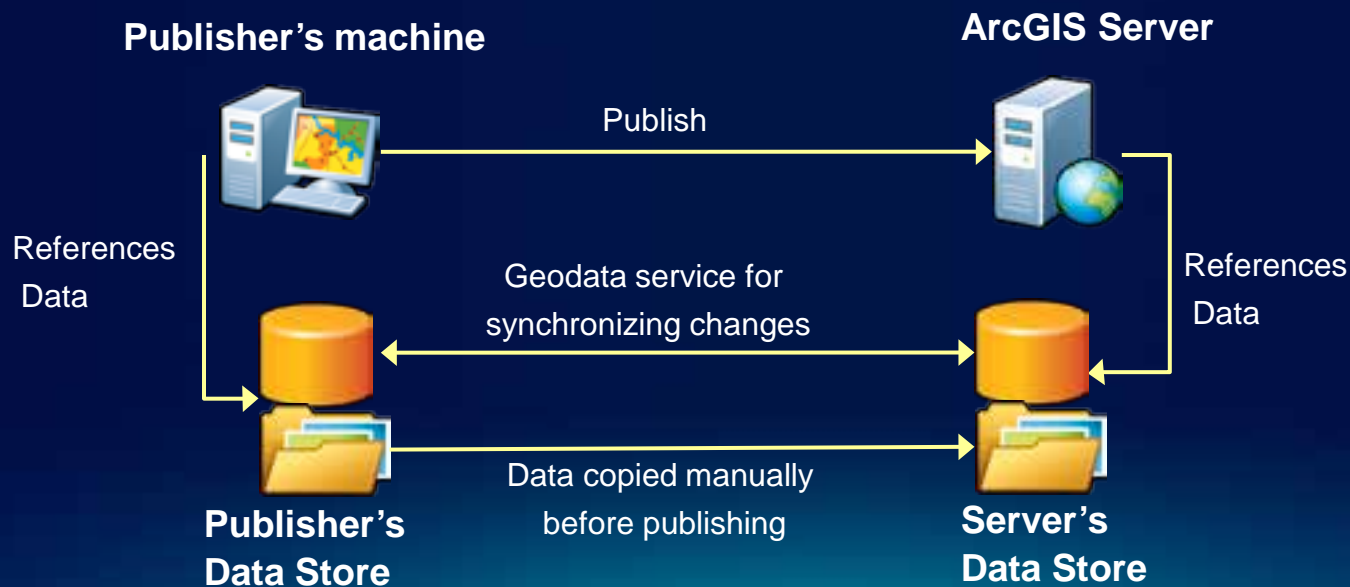
# ArcGIS Server Data Store Registration Workflows

- **Publisher and Server Data Store are the same**
  - Publishing shared data to an on-premise ArcGIS Server
  - Ensures that data is accessible by the server
  - Traditional way of publishing since ArcGIS 9



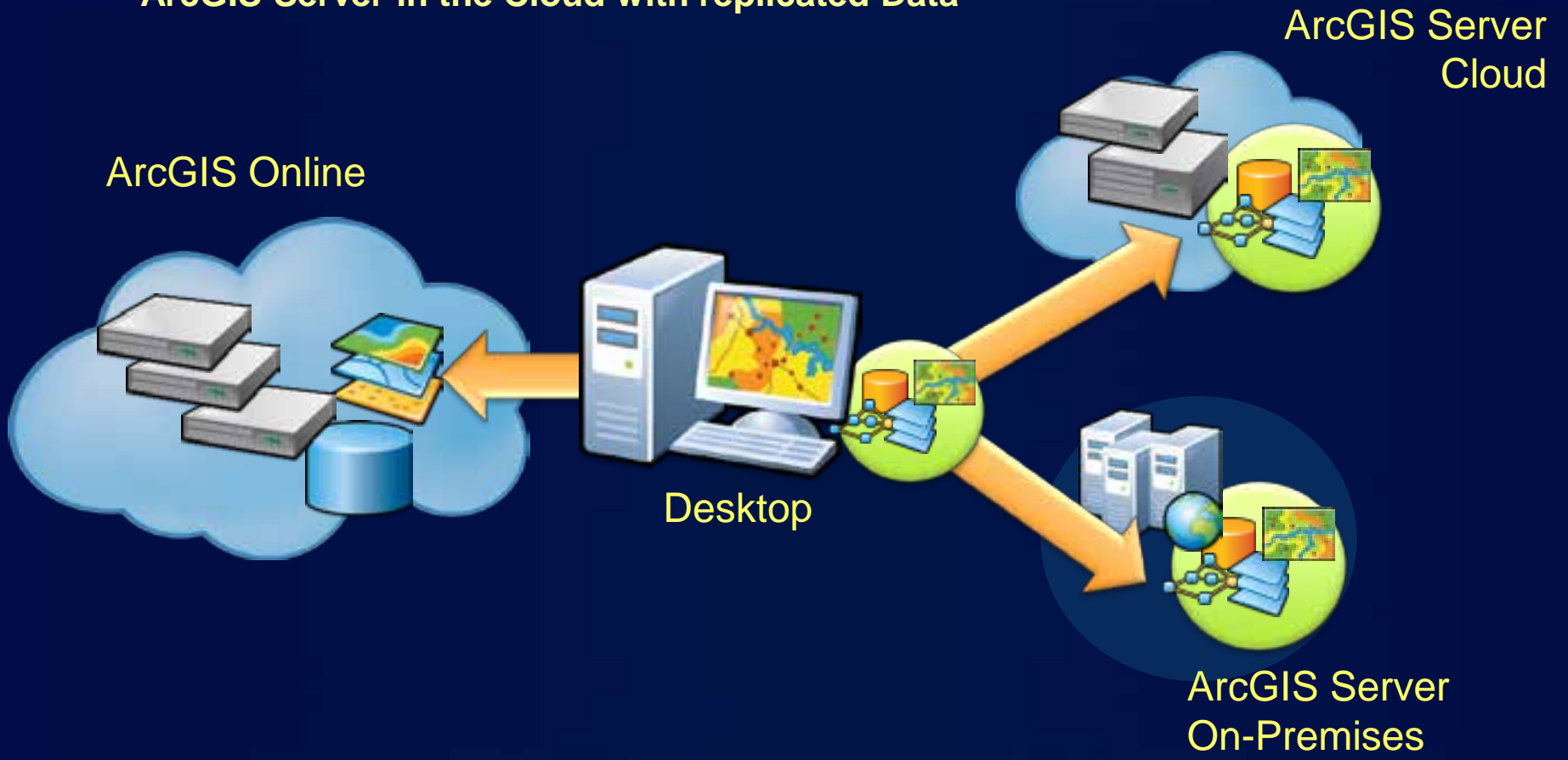
# ArcGIS Server Data Store Registration Workflows

- **Publisher and Server Data Store are different**
  - Publishing using
    - replicated or copied data
    - Data accessed through (SMB/CIFS)
  - Data sources in the map are changed during publishing



# Sharing as Services

ArcGIS Server in the Cloud with replicated Data



# Demo

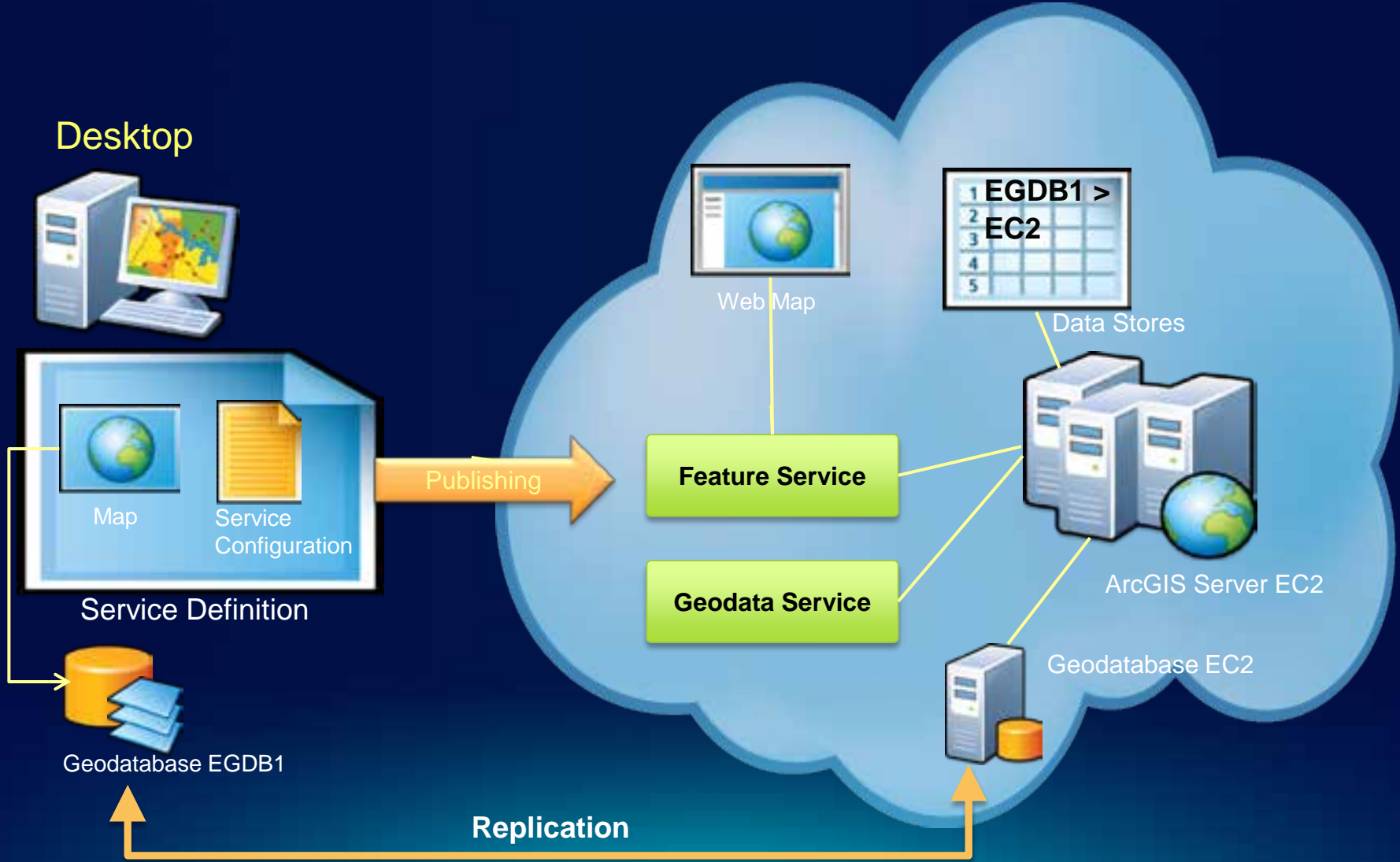
## Sharing services to an ArcGIS Server in the Cloud





# ArcGIS Server in the Cloud

## ArcGIS Server in the Cloud



# ArcGIS Server in the Cloud (replicated Data)

- **Improvements in 10.1**
  - Easier publishing using replicated data
- **When to use**
  - Synchronize data between cloud and enterprise

# Additional Scenarios

- **Publishing to Linux**
  - Manual copies of Data on Desktop and Linux Server
  - Shared Data between Linux / Windows using Samba
- **Publishing Feature Services with copying of data**
  - Registering a server only Enterprise GDB Data Store
- **Publishing to Spatial Data Server (SDS)**
  
- **Videos**
  - <http://video.arcgis.com/series/40/server>

# Migration of existing Map Services

- **All 10.1 Map Services are based on Service Definitions (.sd)**
- **Need existing Map Document (.mxd)**
  - .msd is not compatible
- **Publish**
  - using Service Editor in ArcGIS for Desktop
  - OR
  - using a Python script with the Publishing API

# Publishing Map Services with arcpy.mapping

- Workflow from map document to map service
- Use Python for:
  - Scheduled service upgrades
  - Batch migration from 10.0 to 10.1



# Publishing Map Services with arcpy.mapping

- **Sample: CreateMapSDDraft (arcpy.mapping)**
  - <http://esriurl.com/3934>

Open and  
modify MXD

Create and  
analyze  
SDDraft,  
optionally  
modify XML

Stage and  
publish Map  
Service

```
import arcpy

# define local variables
wrkspc = 'C:/Project/'
mapDoc = arcpy.mapping.MapDocument(wrkspc + 'counties.mxd')
con = 'GIS Servers/arcgis on MyServer_6080 (publisher).ags'
service = 'Counties'
sddraft = wrkspc + service + '.sddraft'
sd = wrkspc + service + '.sd'
summary = 'Population Density by County'
tags = 'county, counties, population, density, census'

# create service definition draft
arcpy.mapping.CreateMapSDDraft(mapDoc, sddraft, service, 'ARCGIS_SERVER',
                              con, True, None, summary, tags)

# analyze the service definition draft
analysis = arcpy.mapping.AnalyzeForSD(sddraft)

# stage and upload the service if the sddraft analysis did not contain errors
if analysis['errors'] == {}:
    # Execute StageService
    arcpy.StageService_server(sddraft, sd)
    # Execute UploadServiceDefinition
    arcpy.UploadServiceDefinition_server(sd, con)
else:
    # if the sddraft analysis contained errors, display them
    print analysis['errors']
```

# Sharing as Services

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# Questions?

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## Enhancements to Map Services

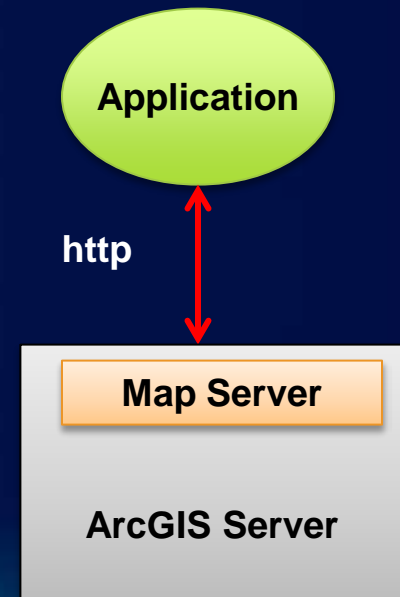
Mohammed Hoque & Craig Williams





# Map services at 10.1

- **One unified map service**
  - An updated optimized map service
  - Supports additional capabilities, data types, layers, renderers
- **New extension capabilities:**
  - Network Analysis
- **New approach for Geoprocessing results**



# Mapping capabilities

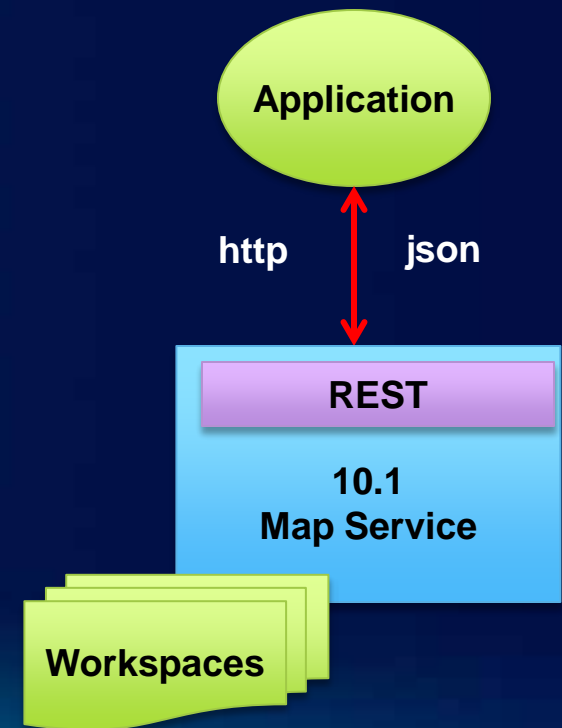
- **Added data source support**
  - XY events
  - Linear referencing events
- **Added feature layer renderer support**
  - Dot density
  - Charts
  - Geostats
- **Added support for layers**
  - Dimensions
  - Schematics
  - Network
  - Network Analysis
  - Tin
  - Terrain
  - Tracking

# Dynamic Layers: The Concept

- **New behavior with the map service that allows for per-request changes to the map**
- **Optional capability of map services**
- **Allows for:**
  - **Updating renderers and symbols**
  - **Removing and reordering layers**
  - **Changing layer data sources**
  - **Adding new layers from registered data sources**

# Dynamic Layers: Use Cases

- **Simple updates to the map service**
  - Remove layers or reorder layers
- **Thematic mapping**
  - Updates to renderers
- **Adding content to the map service**
  - Add data from registered workspaces
    - Including query layers
  - Add to the map on a per-request basis
    - WebAPIs handle this for you



# Thematic mapping

- **Special case of dynamic layers supported via**
  - Ability to change renderer
  - Ability to change data sources – including joins
  - New map server API for constructing renderer classes
- **Generate renderer operation**
  - Supports class breaks and unique value class generation
  - Popular classification types from ArcGIS Desktop

# Demo

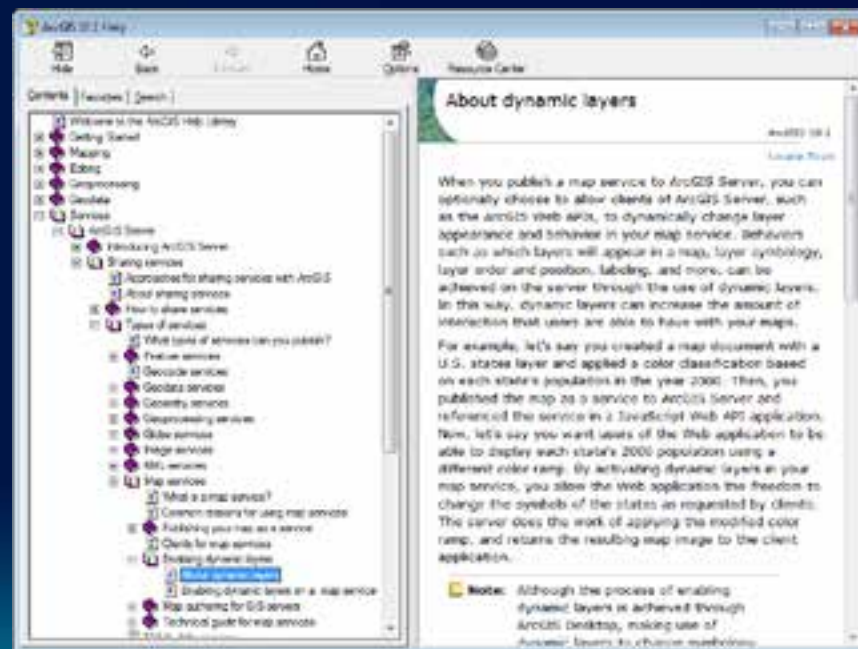
- **Dynamic layers – thematic mapping**

# Thematic Mapping

- **When do I use dynamic layers instead of feature layers on the client for thematic mapping?**
  - large number of features
  - complex geometries that cannot be generalized
  - when it provides a performance advantage
- **Each approach has tradeoffs**
  - e.g. Client side features scale better and provide more interactive behavior
  - Generate renderer can be used with both approaches

# Dynamic Layers: More information

- See the topic “About dynamic layers” in the ArcGIS Server help
- REST API – See the “Dynamic Layer / Table” resource help





## Query enhancements at 10.1

- **Support for order by, output statistics, and group by statistics was added for both layers / tables**
  - **count | sum | min | max | avg | std dev | var**
- **Optional ability to return M and Z values for features**
- **Can query a specific geodatabase version**
- **Query response contains a flag when maxRecordCount was reached by the query**

# Demo

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- **Statistics demo**



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