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DEVELOPER SUMMIT

EUROPE

# Extending ArcGIS Enterprise

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# Agenda

- Introduction
  - Extending ArcGIS Enterprise
  - ArcGIS Enterprise SDK
- Server Object Extensions
  - Demo
- Server Object Interceptors
  - Demo
- Q&A

# ArcGIS Enterprise

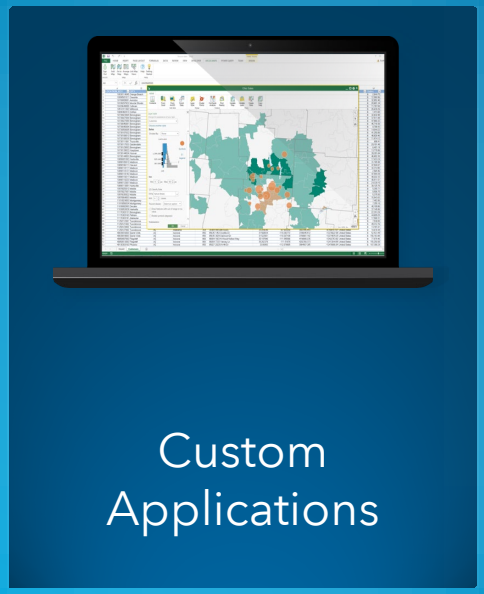
- Powerful built-in mapping and analytics
- Configurable tools and templates

# Why?

Motivations for extending ArcGIS Enterprise

- Existing behavior is not adequate
- Custom business logic
- Security
- Integrating disparate systems

# Extension Options



Custom Applications

Geoprocessing Services

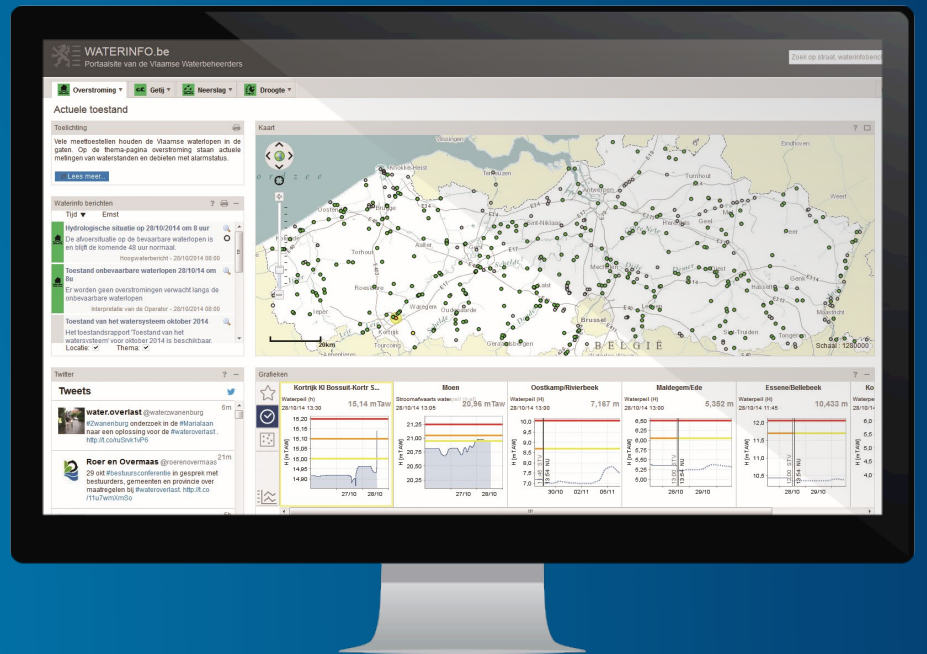
Server Object Extensions

Server Object Interceptors

# Custom Applications

## Extension Options

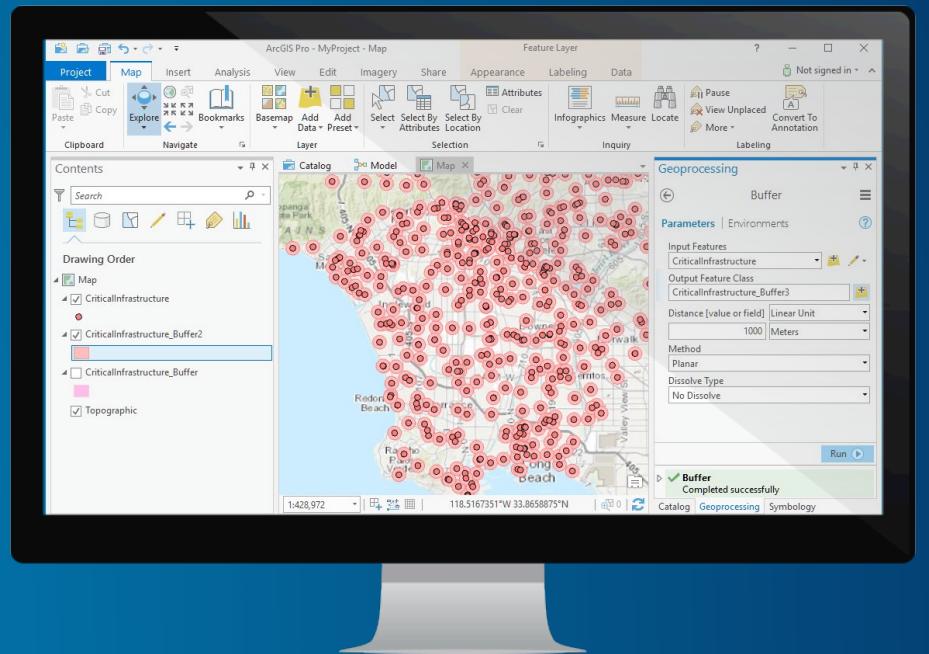
- Specific set of Business Logic
- Performance Client-Side
- (Mostly) Specific to one platform
- Lifecycle/Code Management



# Geoprocessing Services

## Extension Options

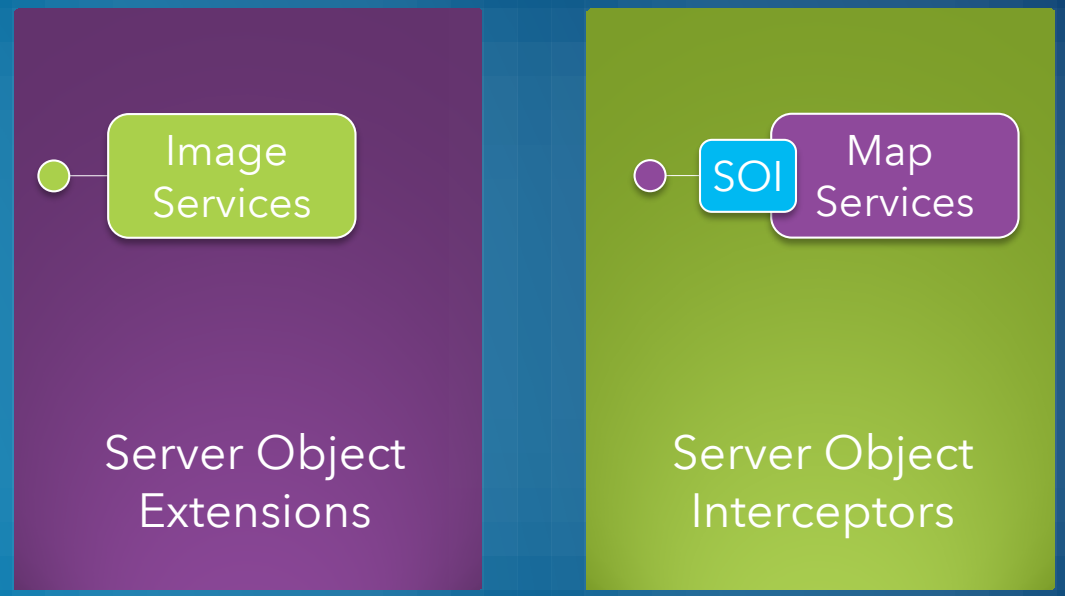
- “Bread and Butter” of GIS Analysts
- Full GIS library
- Python | ArcObjects
- Asynchronous



# Server Object Extensions and Server Object Interceptors

## Extension Options

- SOE adds functions to services
- SOI modifies/extends service functions



# Server Object Extensions and Server Object Interceptors

## Extension Options

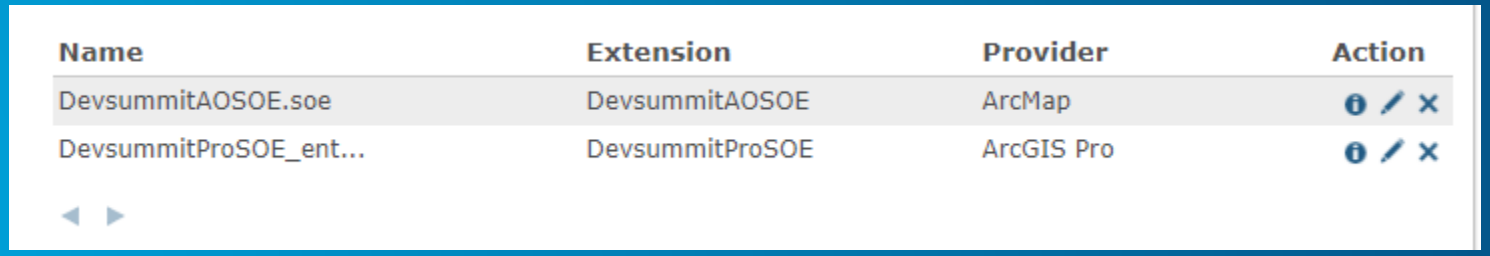
**Common**

| |
|---|
| Service : Object = 1 : n |
| No worries about Authentication and Authorization |
| No additional Hardware needed |
| Enhance Map, Feature and Image Services |
| Server-Side Code \| .NET or Java |
| ArcObjects or ArcGIS Enterprise SDK |

# ArcGIS Enterprise SDK

- ArcGIS Enterprise SDK : new SDK available since 10.6.1
- For “server side” extensions : SOE and SOI
- For extending services published from ArcGIS Pro
- In .NET **and** Java

- Similar API to ArcObjects SDK, not the same.
- ArcObjects extensions can be migrated to use the Enterprise SDK
- Enterprise SDK and ArcObjects SDK can coexist



# ArcGIS Enterprise SDK

- ArcObjects is a huge SDK
  - Very large scope
  - Compatibility with old versions : lot of interfaces

**All Implemented Interfaces:**
IMapServer, IMapServer2, IMapServer3, IMapServer4, ITiledMapServer, ITiledMapServer2, ITiledMapServer3, IAGSServerObject, IAGSServerObject2,

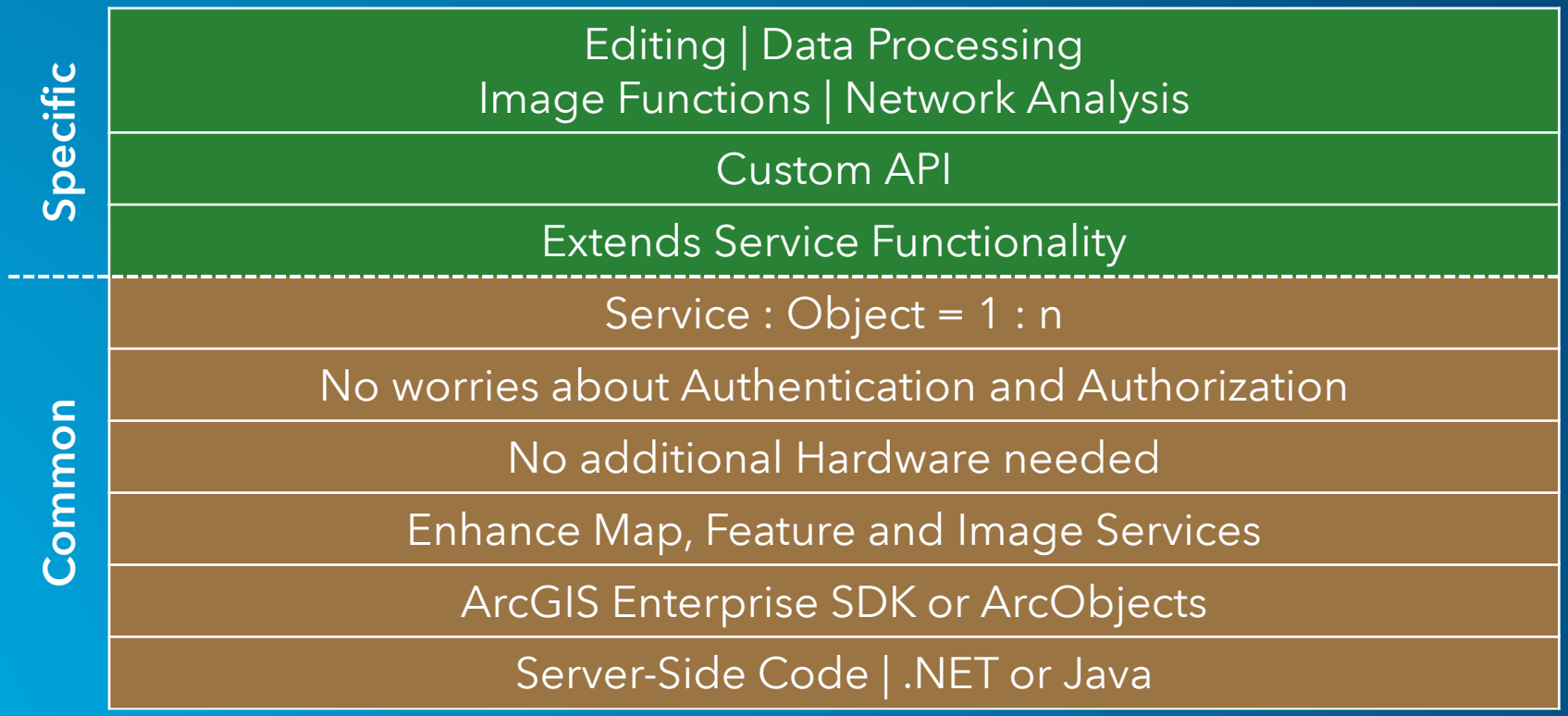
  - Not that simple to get into

- Enterprise SDK aim to be easier to get started
  - While keeping the core function used by SOE and SOI
    - Data access : Geometry and Geodatabase
    - Map service manipulation
    - Extending ArcGIS Server

# Server Object Extensions

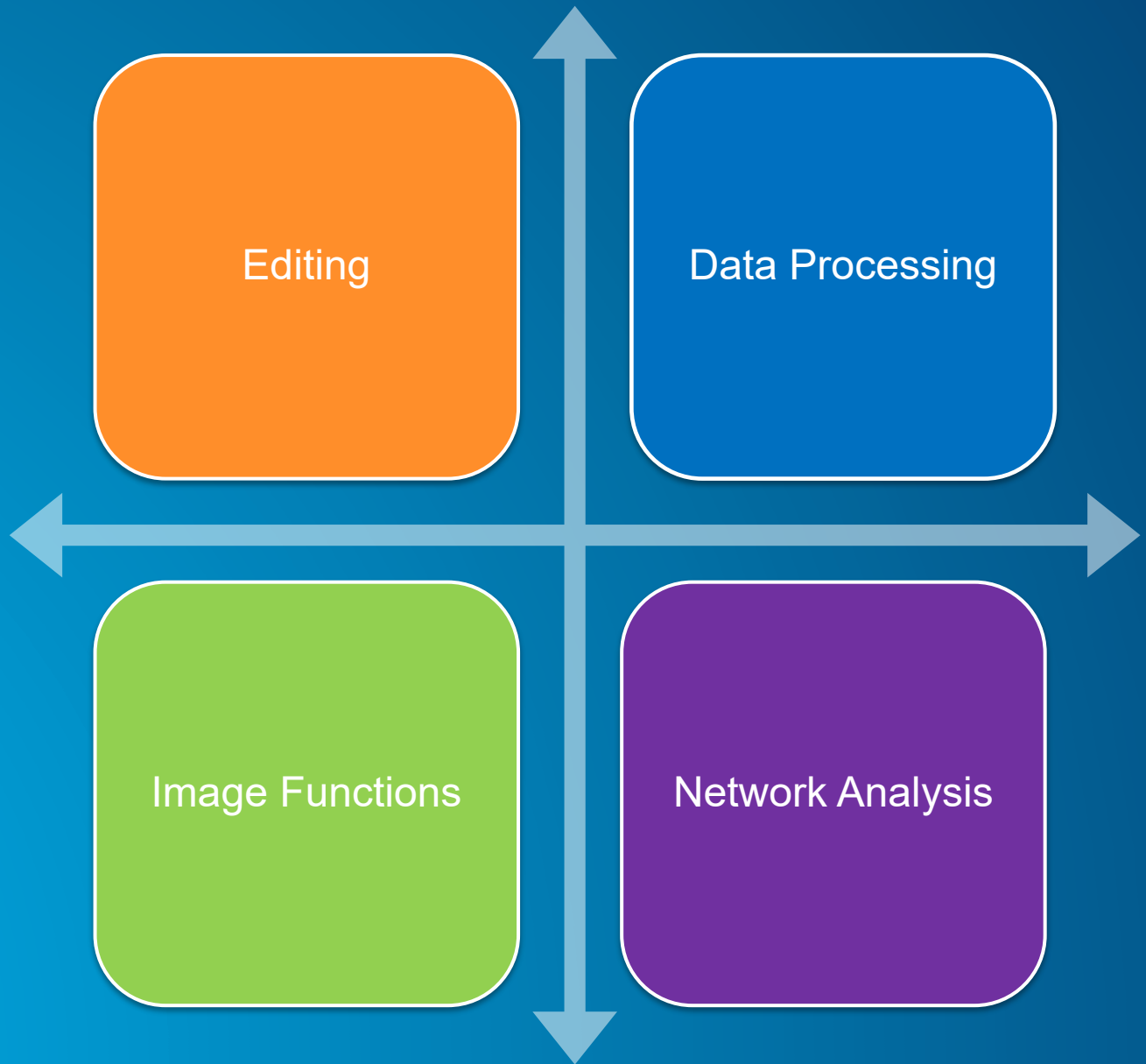
# Server Object Extensions

The Basics



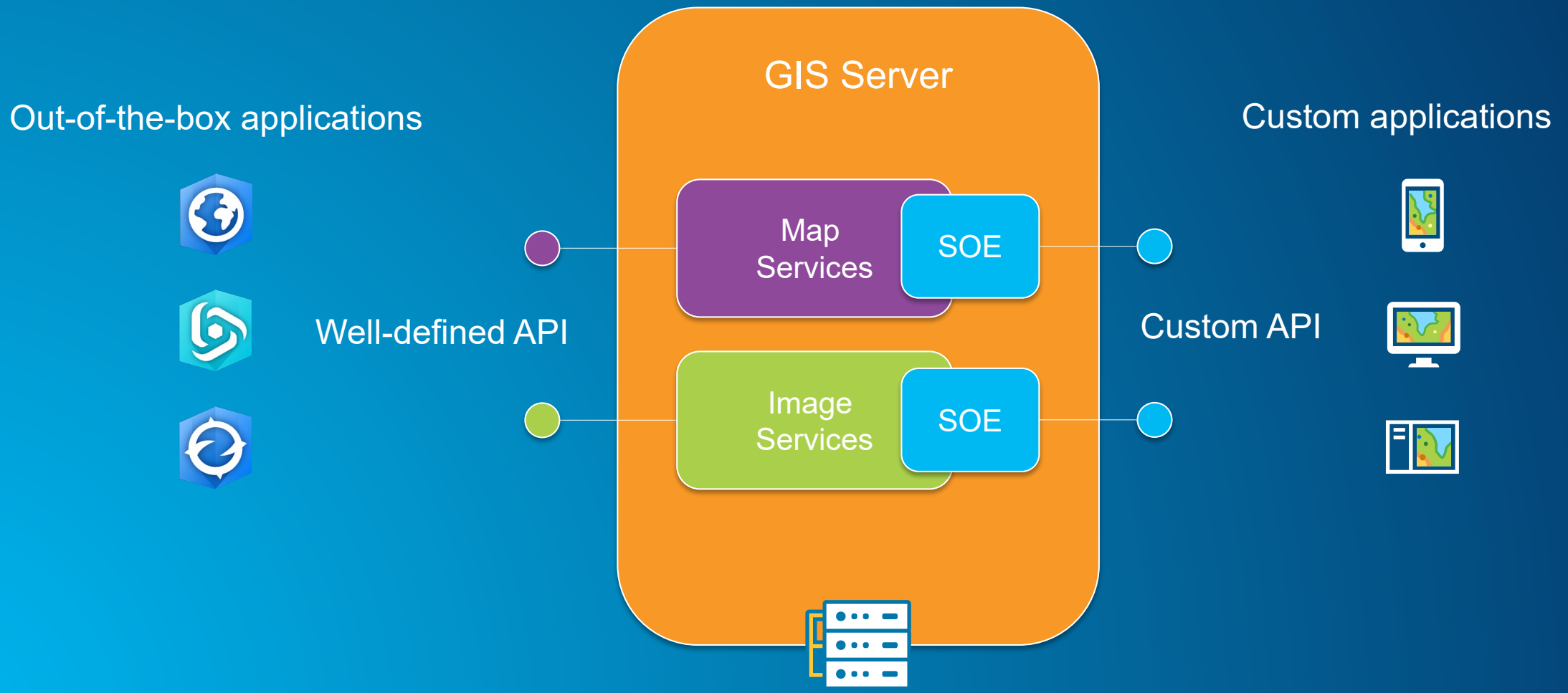
# Server Object Extensions

## Use Cases



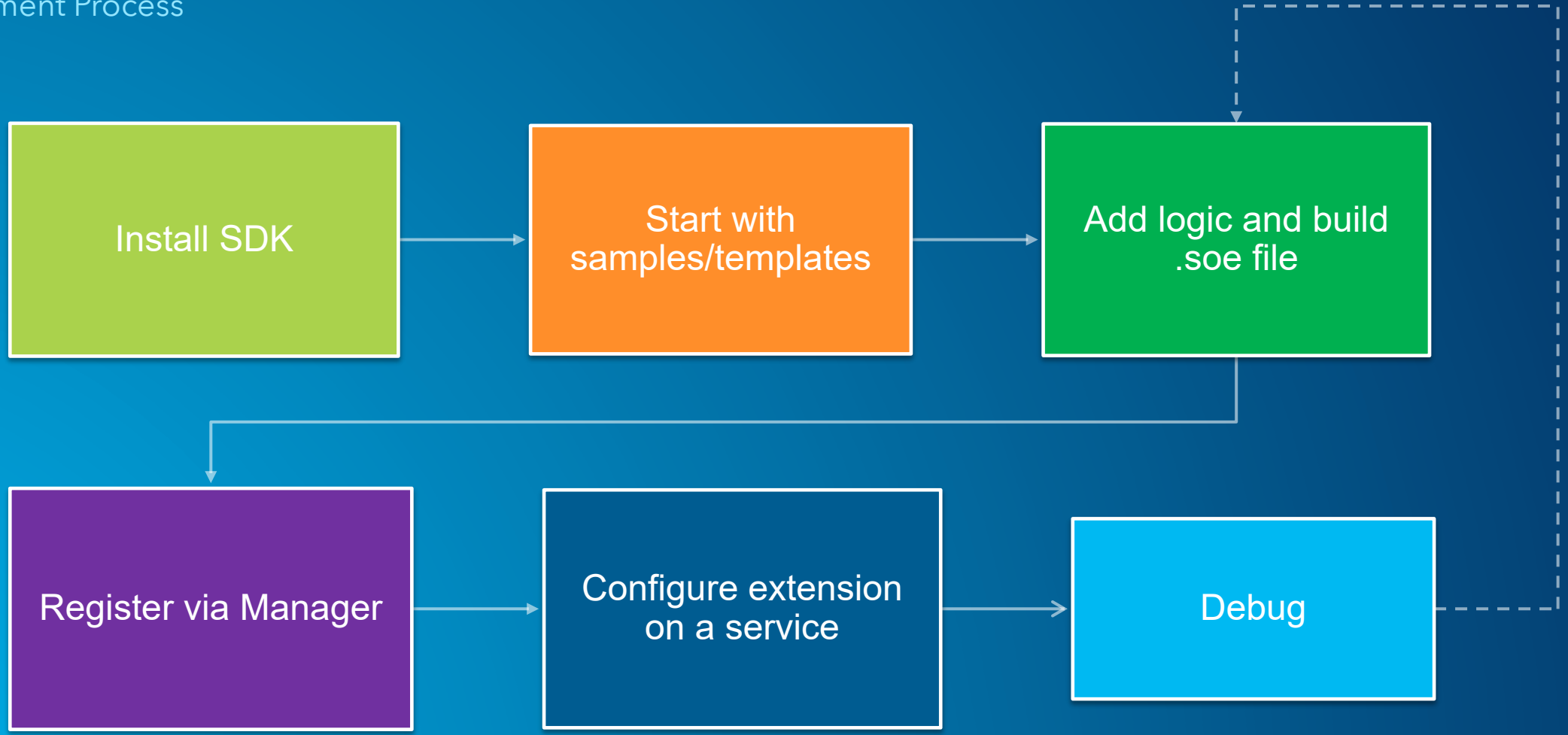
# Server Object Extensions

## Architecture



# Server Object Extensions

## Development Process



# Server Object Extensions

## Implementation Notes

| Name | Functions | Purpose |
| --- | --- | --- |
| IServerObjectExtension | init(…)<br>shutdown() | Initialization of SOE<br>Cleanup |
| IRESTRequestHandler | getSchema()<br>handleRESTRequest(…) | Define the API as resources and operations<br>Handle all REST resources and operation requests |
| IRequestHandler2 | handleStringRequest(…)<br>handleBinaryRequest(…) | Handle SOAP requests<br>Handle "binary" requests from ArcMap |
| IWebRequestHandler | handleStringWebRequest(…) | Handle OGC requests |

# Demo

Server Object Extension

# External data API SOE

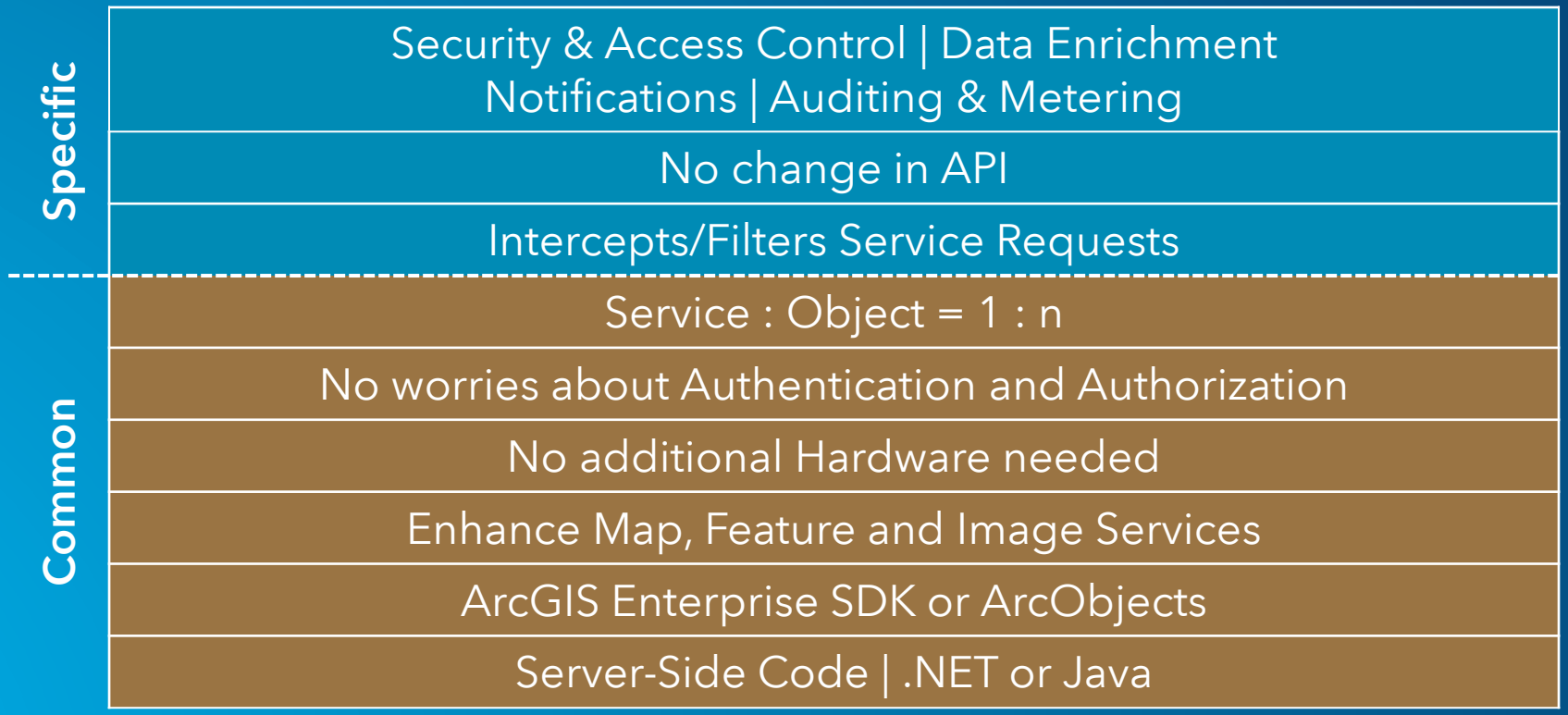
- We have a super real time parking status solution
- It's not available with an API
- Information is only in a specific Database
- The database is not spatial
  - But we have the long/lat of the sensors !

Let's use the SOE to make our own REST API !

# Server Object Interceptors

# Server Object Interceptors

The Basics



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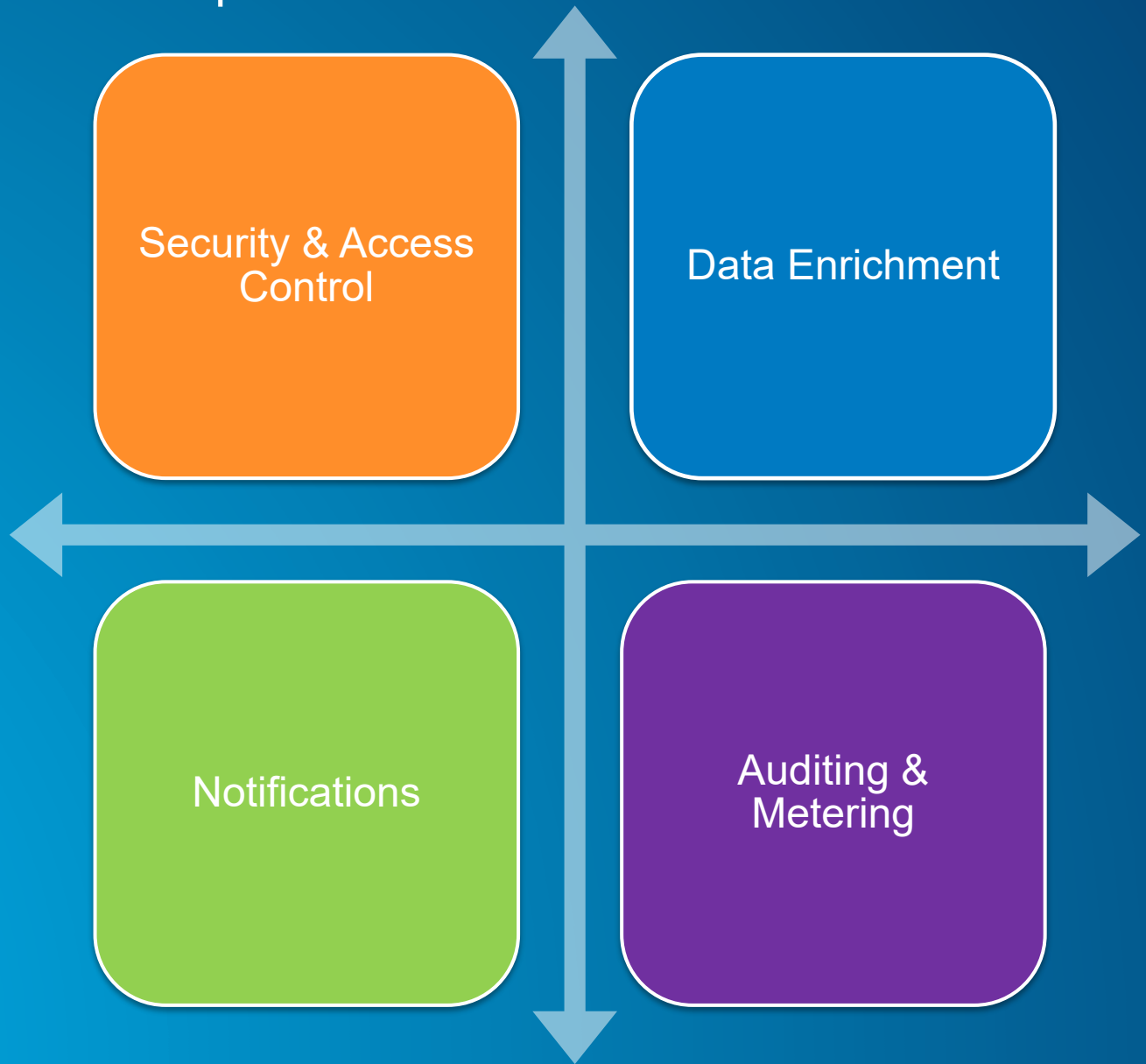
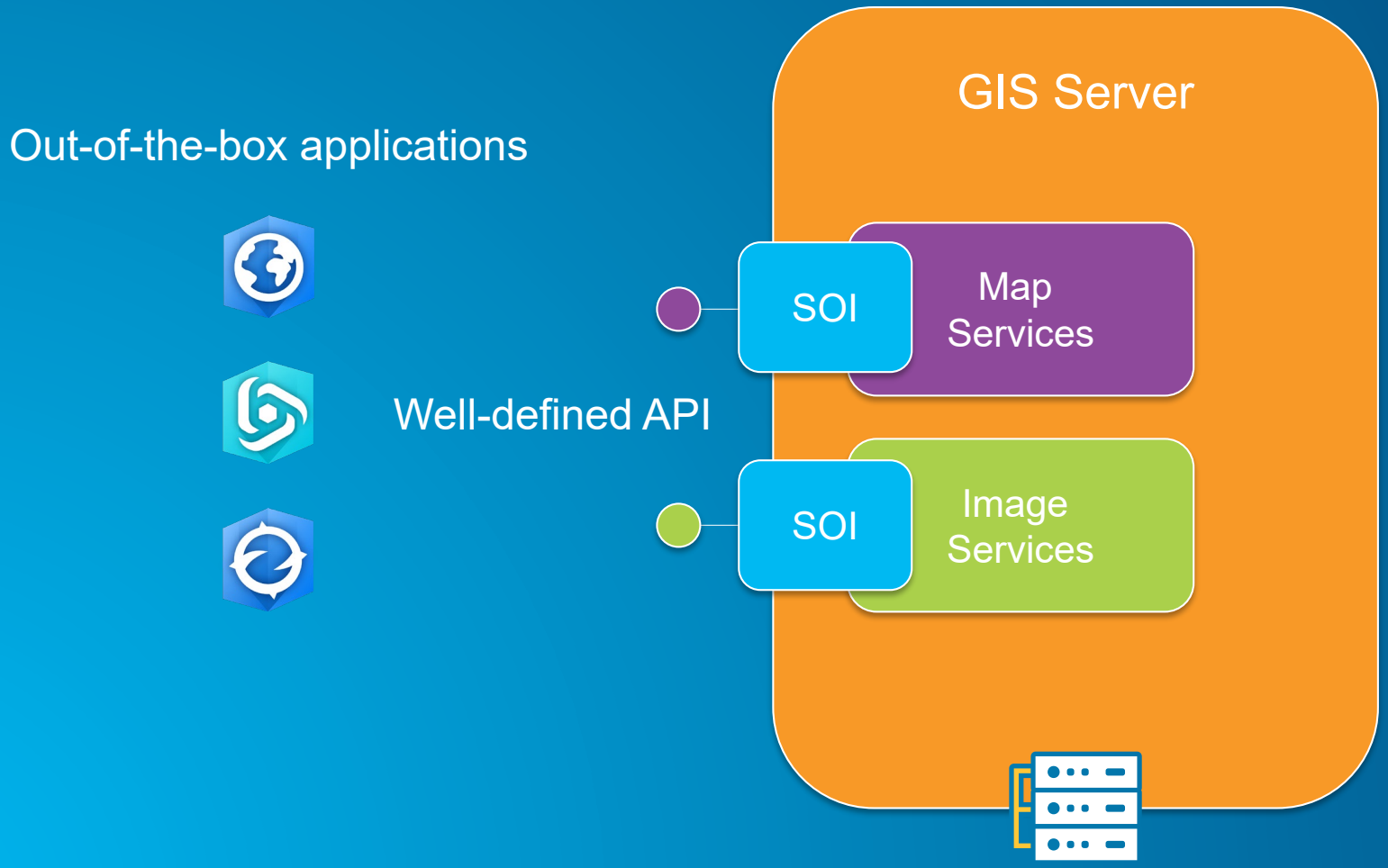


# Server Object Interceptors

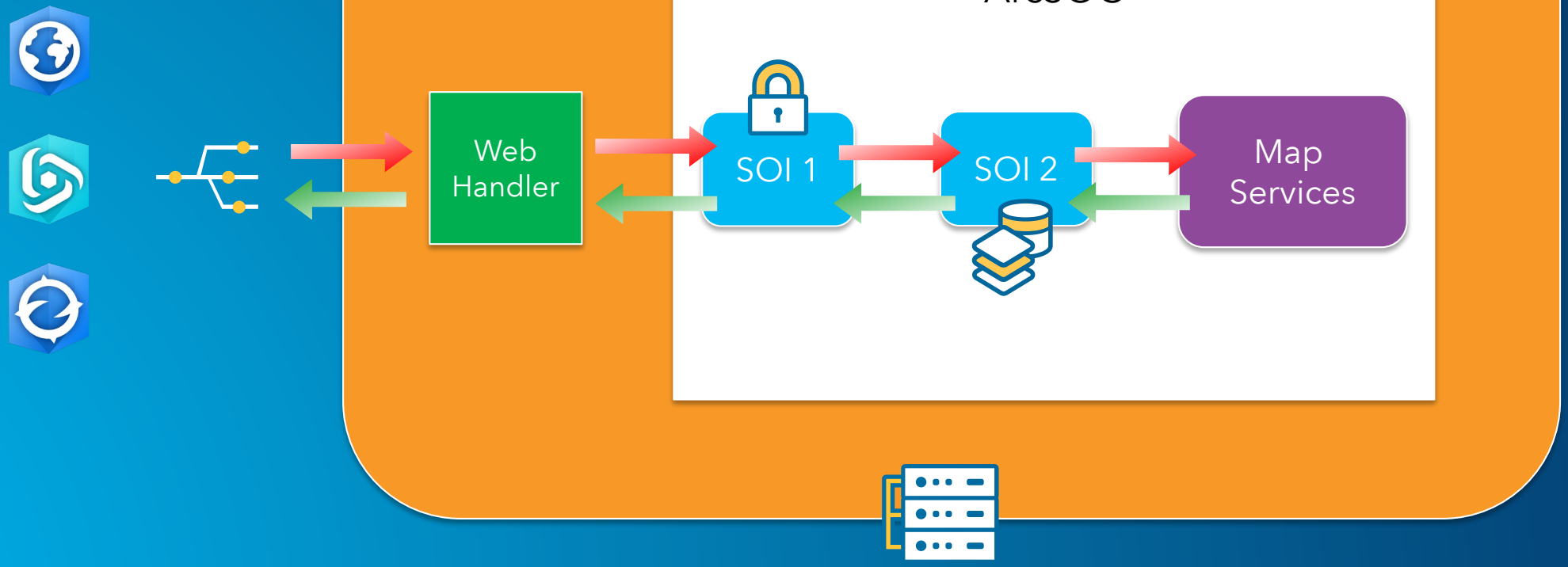
## Architecture



# Server Object Interceptors

## Call Sequence

Out-of-the-box applications



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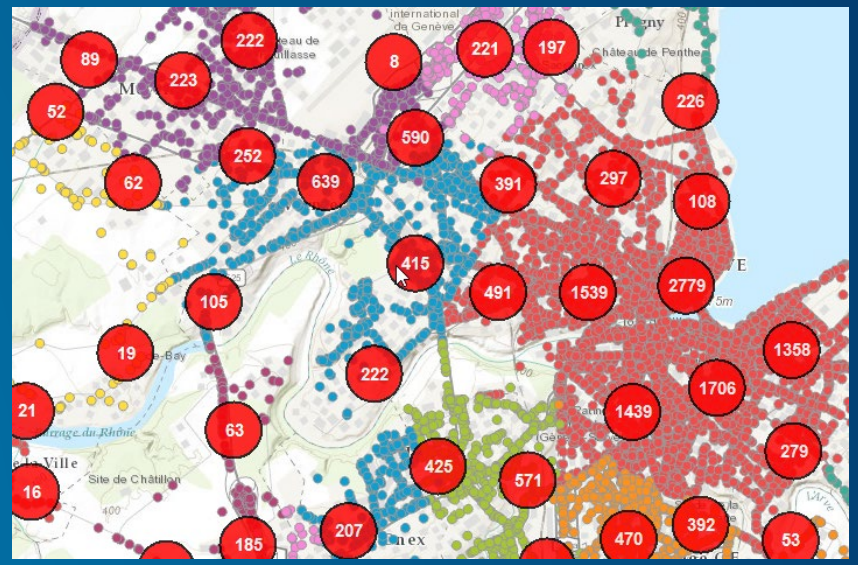
# Demo

Server Object Interceptor

https://github.com/ceddc/devsummit-berlin-2018-SOI

# Server side cluster SOI : how to ?

- Intercept the export map request
- Parse the parameters to get the Extent
- Request the database to get all points for the first layer in the Extent
- Cluster them !
  - Every point in 80 px radius get clustered
  - Put the cluster center at the average coordinates
- Create a new image of the clusters
- Send the new image instead of the normal one.




https://github.com/ceddc/devsummit-berlin-2018-SOI

# Best Practices and Tips

Extending ArcGIS Enterprise

# Best Practices and Tips

## Troubleshooting

- Logging
  - Access to Server Logger in your code
  - Use various log levels (SEVERE, WARNING, INFO, …)
  - Query logs using ArcGIS Server Manager or the Admin API
  - Add logs in the initialization routines!
- Don’t forget to package your dependencies!
- Be aware of service startup time if initialization takes longer

# Best Practices and Tips

## Debugging

- Hint: Process command line contains the name of the service
  - Example: -Dservice=parcels.MapServer
- .NET
  - Attach Visual Studio to running ArcSOC process
- Java
  - Using ArcGIS Server Manager, enable remote debugging and configure port range
  - Configure IDE for remote debugging
  - Attach IDE to running ArcSOC process on a specific port

# Best Practices and Tips

Key Takeaways

## Samples & templates

Use GP services for long running tasks

Don’t change the API in an SOI

## Implement security carefully

No SOIs for hosted feature or tile requests yet

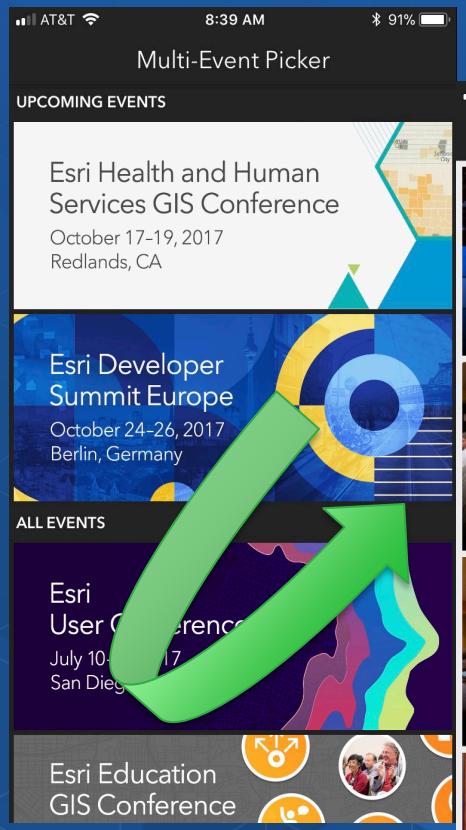
May need to increase ArcSOC heap size for intensive extensions

# Questions?

Automate and Configure ArcGIS Enterprise

# Please Take Our Survey!

**Download the Esri Events app and go to DevSummit**

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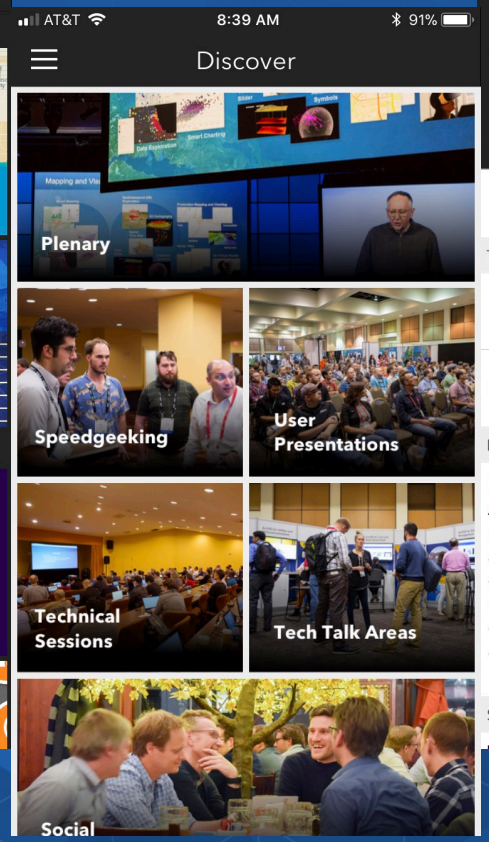


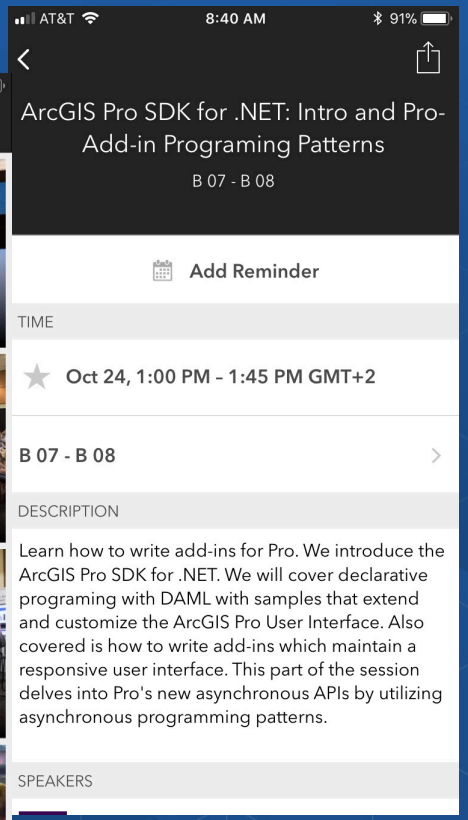


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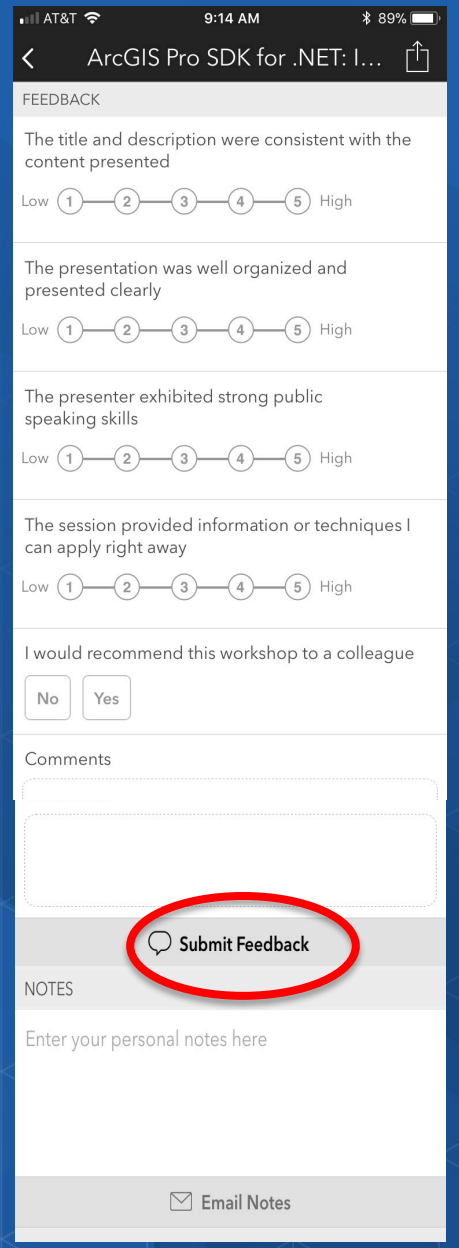

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