



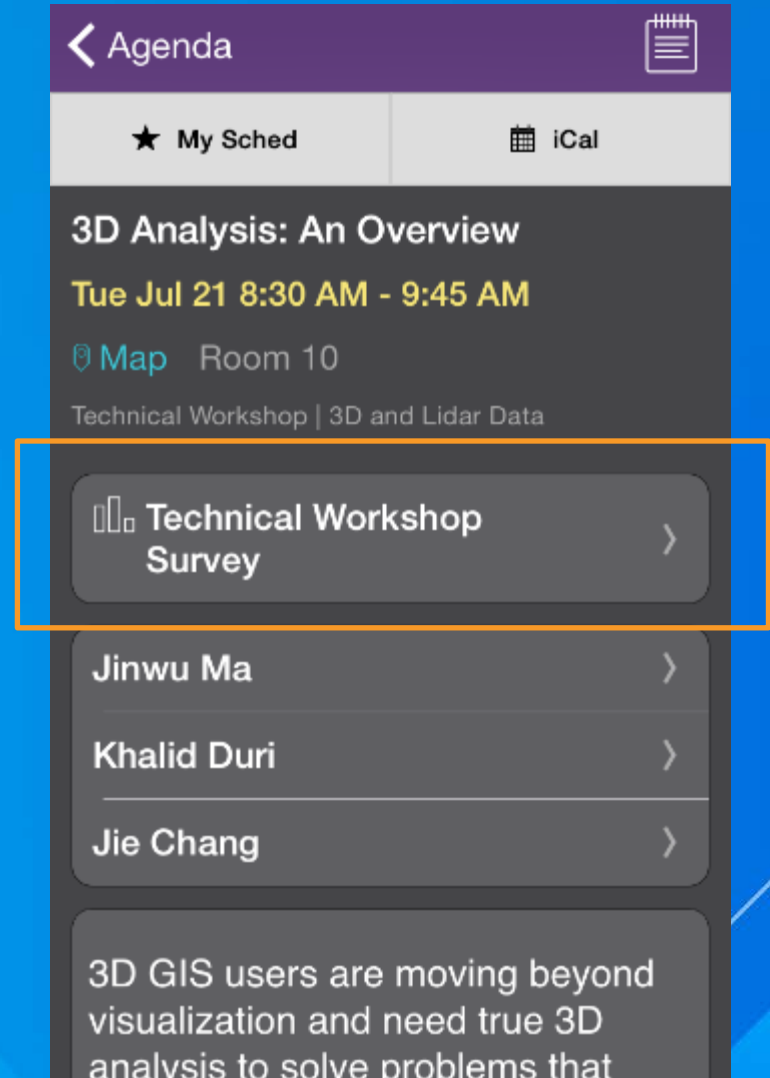
# ArcGIS for Server: Reference Implementations

Anthony Moralez

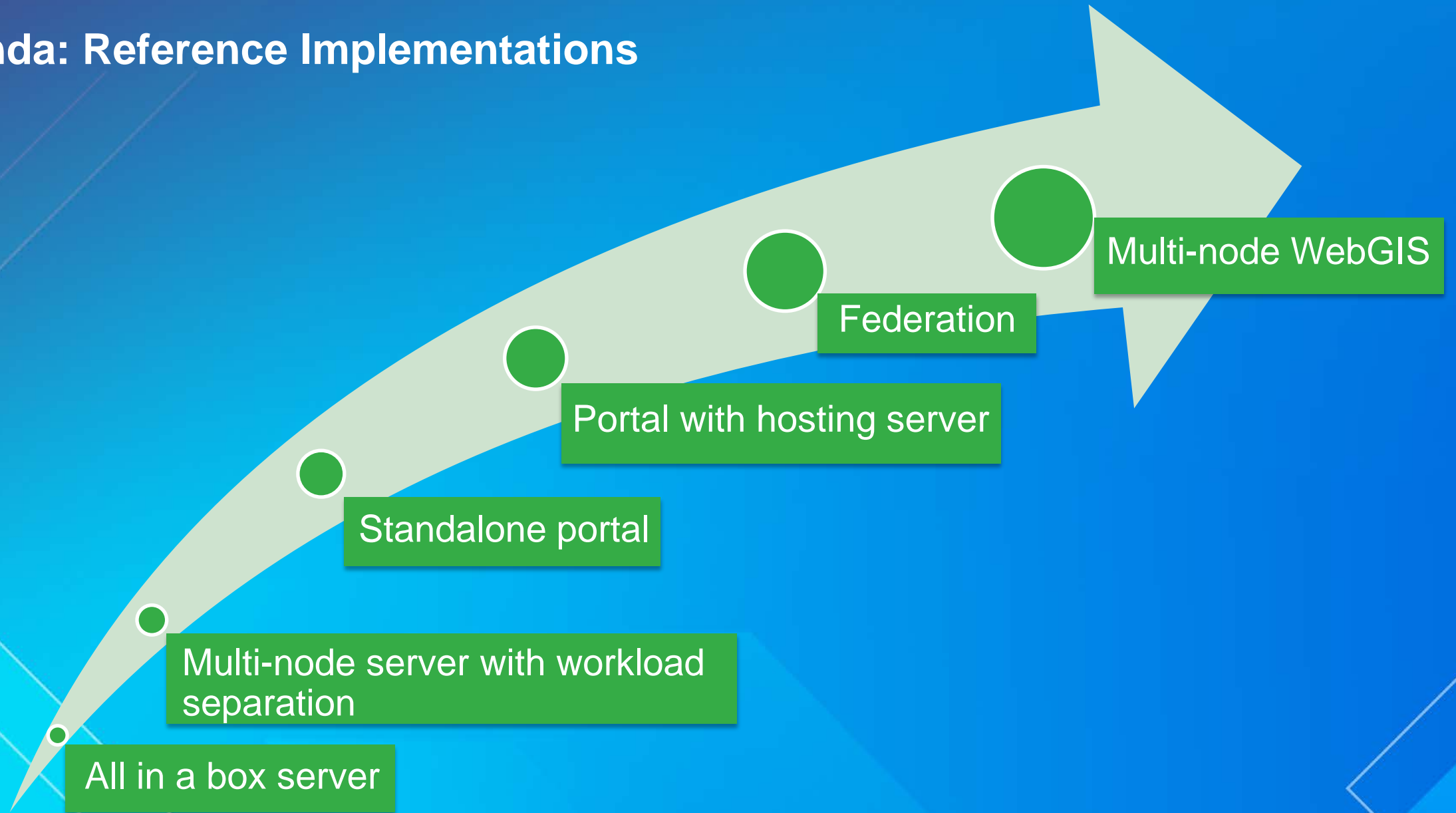
Shreyas Shinde

## Before we begin...

- Please fill out the session survey in your mobile app
- Select “ArcGIS for Server: Reference Implementations” in the Mobile App
  - Use the Search Feature to quickly find this title
- Click “Technical Workshop Survey”
- Answer a few short questions and enter any comments



# Agenda: Reference Implementations

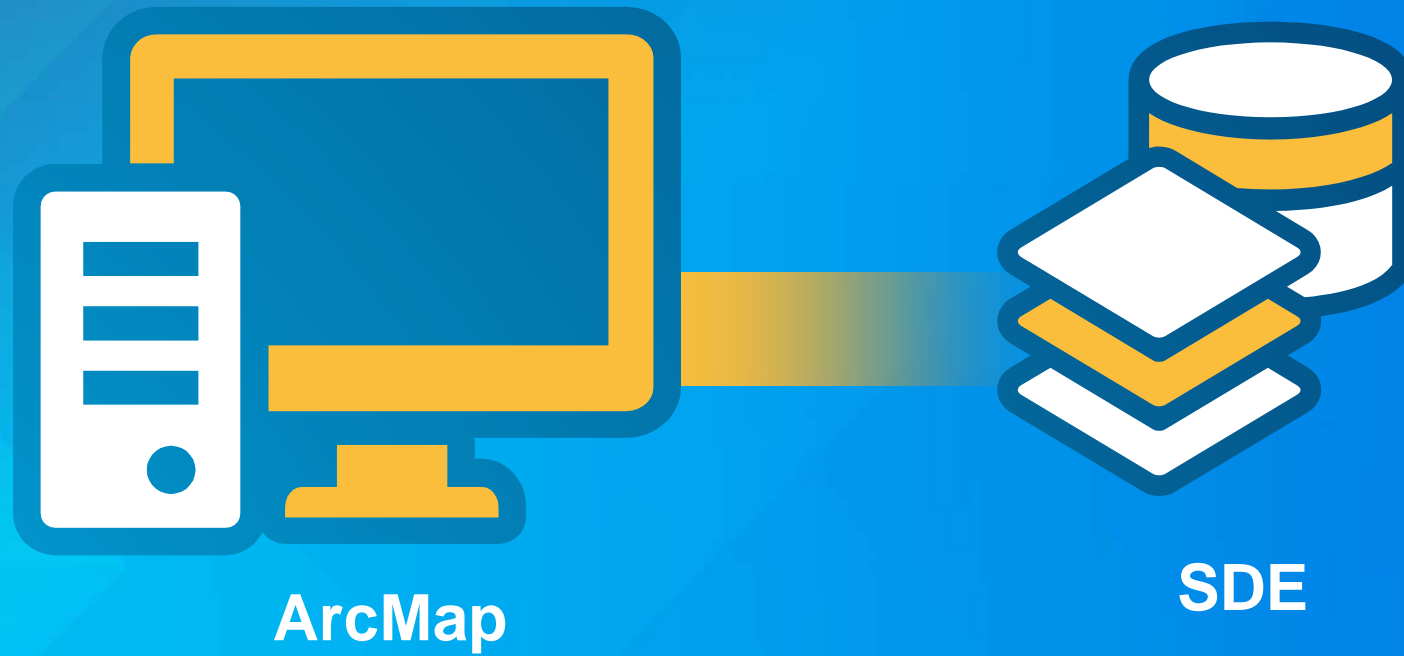


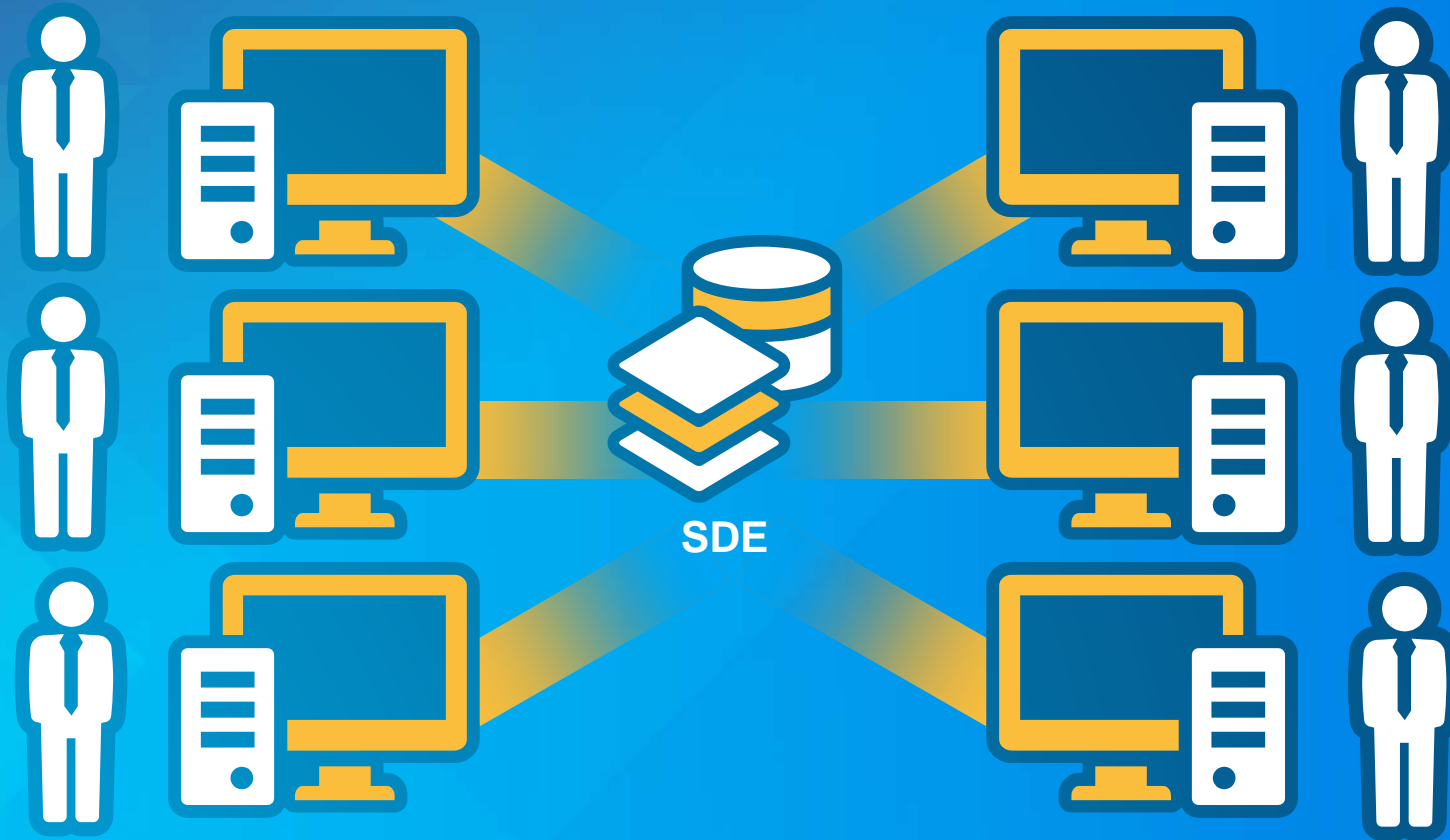
**Gillian**

GIS Administrator



## Our Journey Begins Here – Circa 10.1



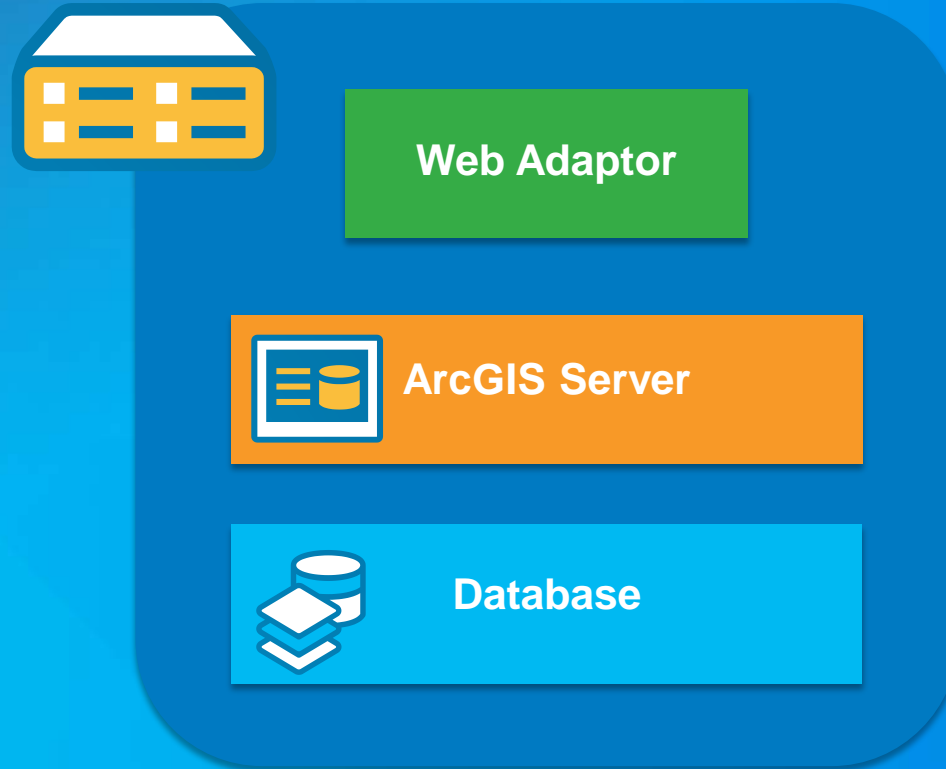


## ArcGIS Server – All in one machine

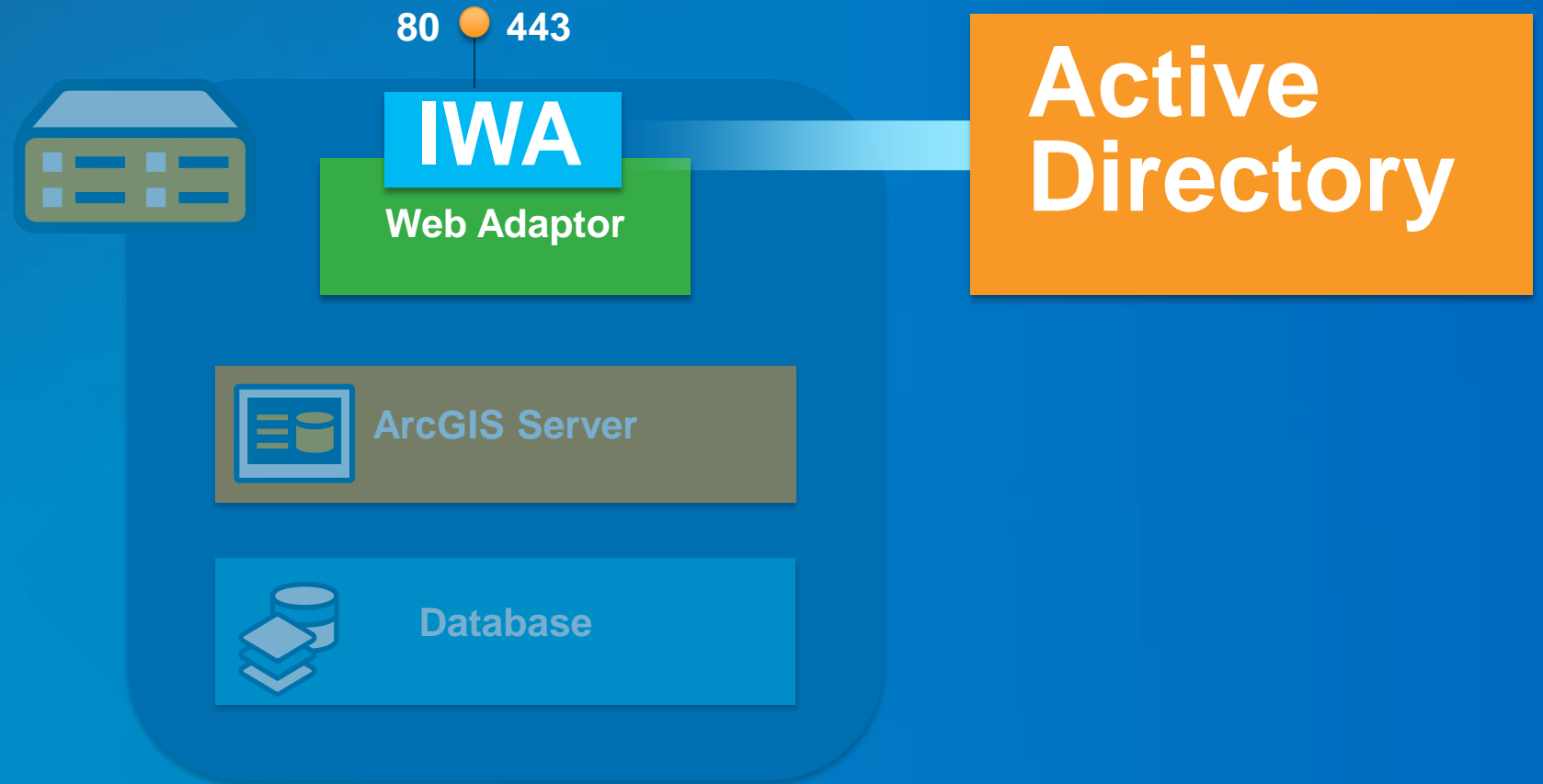
**Simple**

**But**

**Not fault tolerant  
Limited scalability**



# ArcGIS Server – All in one machine





## Reference Implementations

# Success!



All in a box server

- Security
- Availability
- Capacity

Multi-node server with workload separation

Standalone portal

Portal with hosting server

Federation

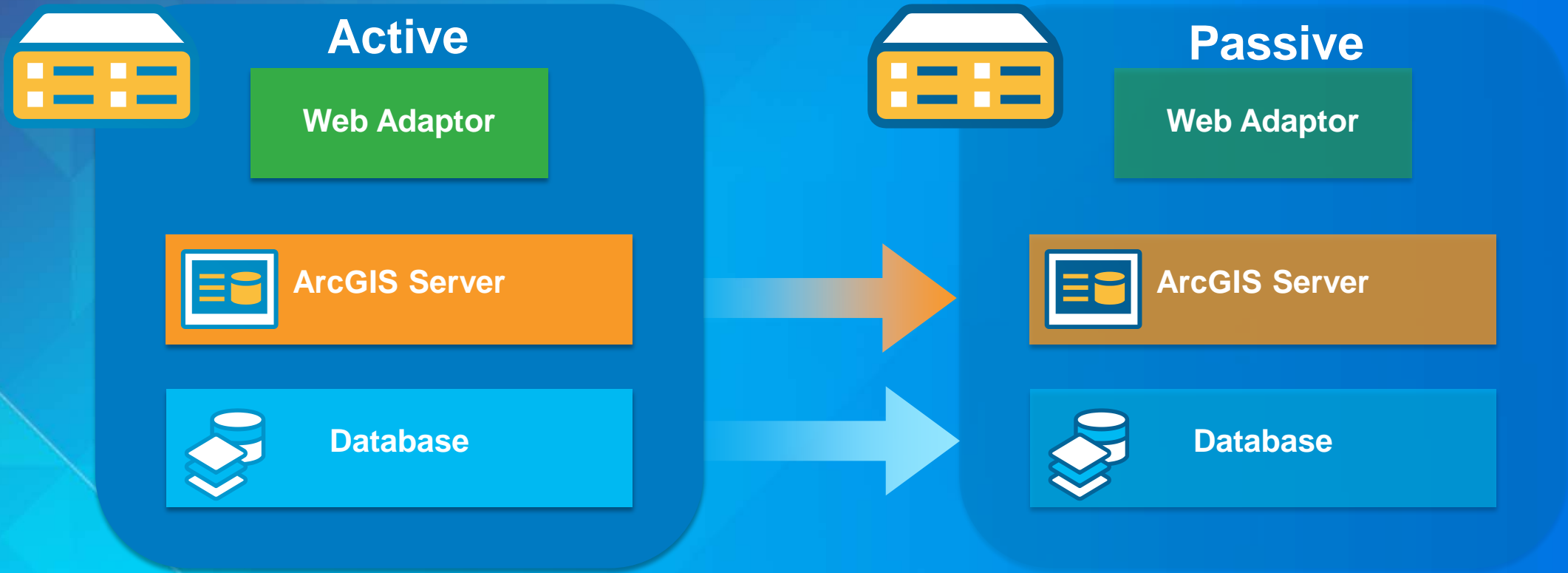
Multi-node WebGIS

# Availability

At a low cost?



# ArcGIS Server – All in one machine



## Reference Implementations

# Success!



All in a box server

- ✓ Security
- ✓ Availability
- ☐ Capacity

Multi-node server with workload separation

Standalone portal

Portal with hosting server

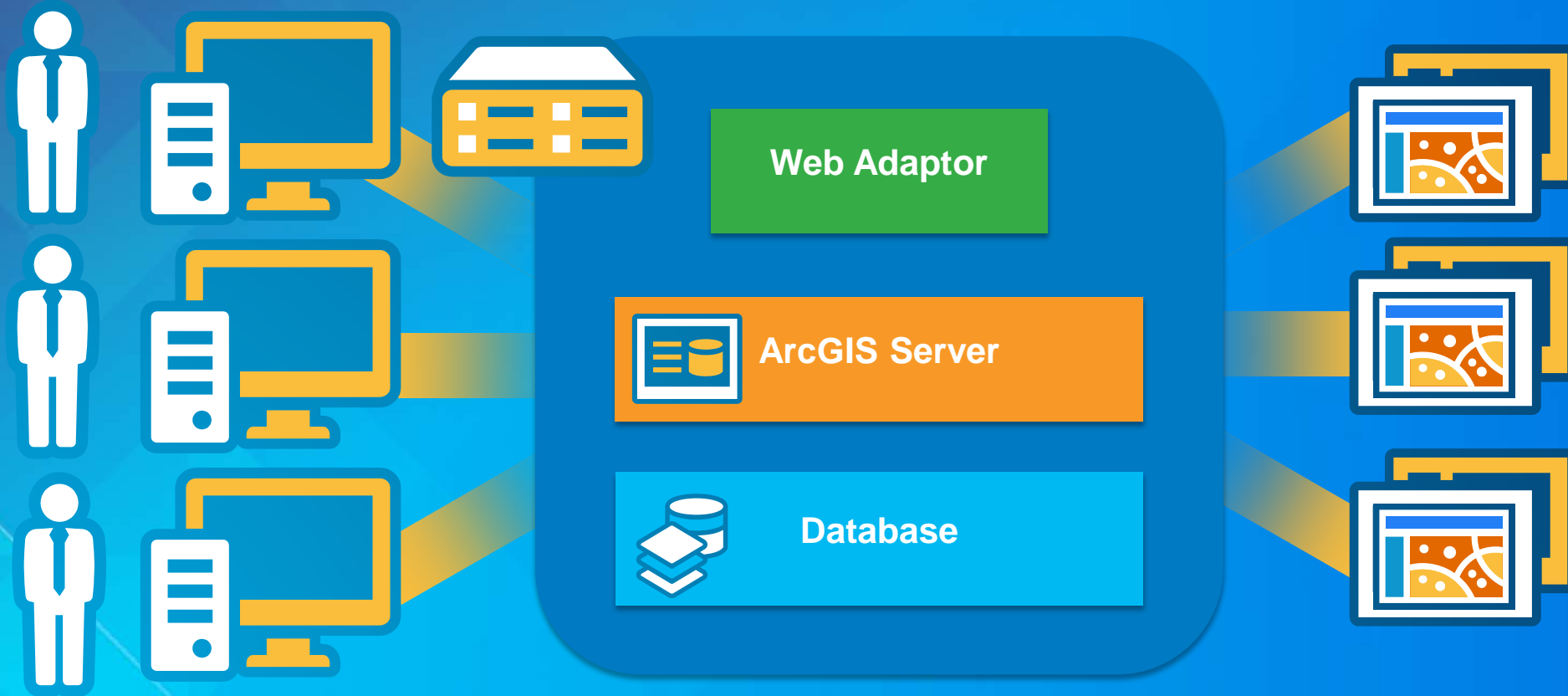
Federation

Multi-node WebGIS

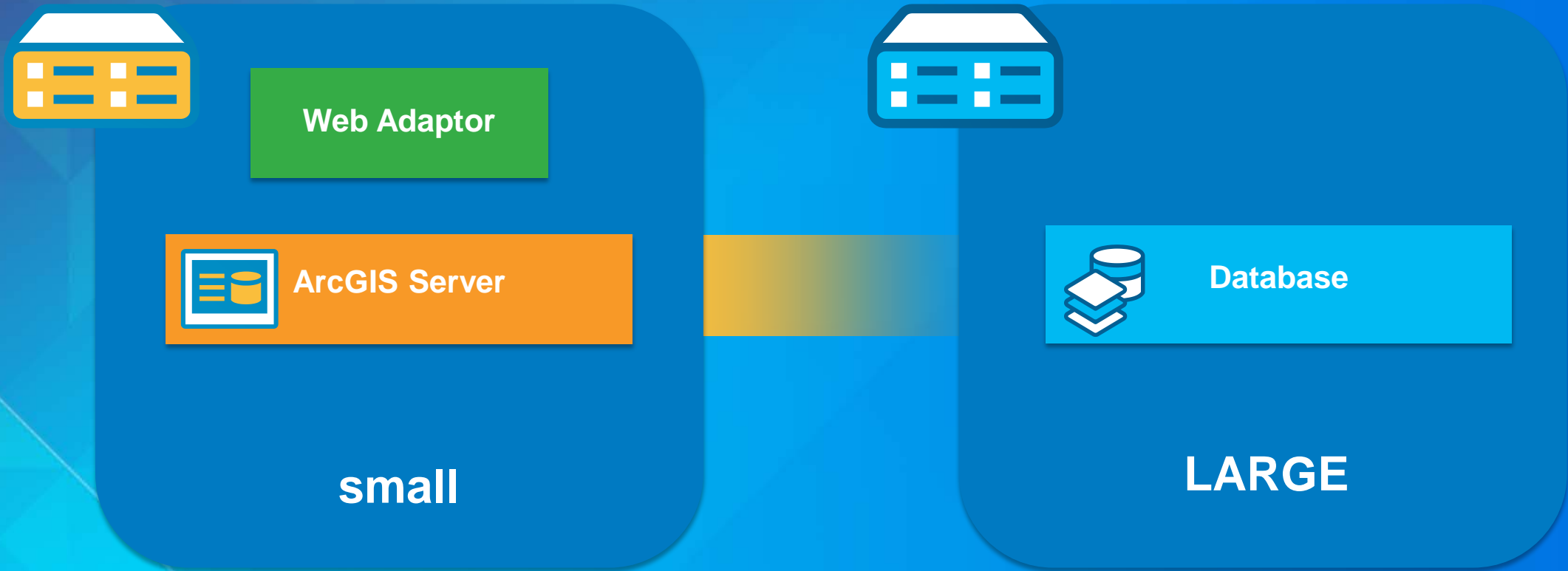
# Nearing Capacity



# Success means more publishers and users



# ArcGIS Server – Separate Database



## Reference Implementations

# Success!



All in a box server

- ✓ Security
- ✓ Availability
- ✓ Capacity

Multi-node server with workload separation

Standalone portal

Portal with hosting server

Federation

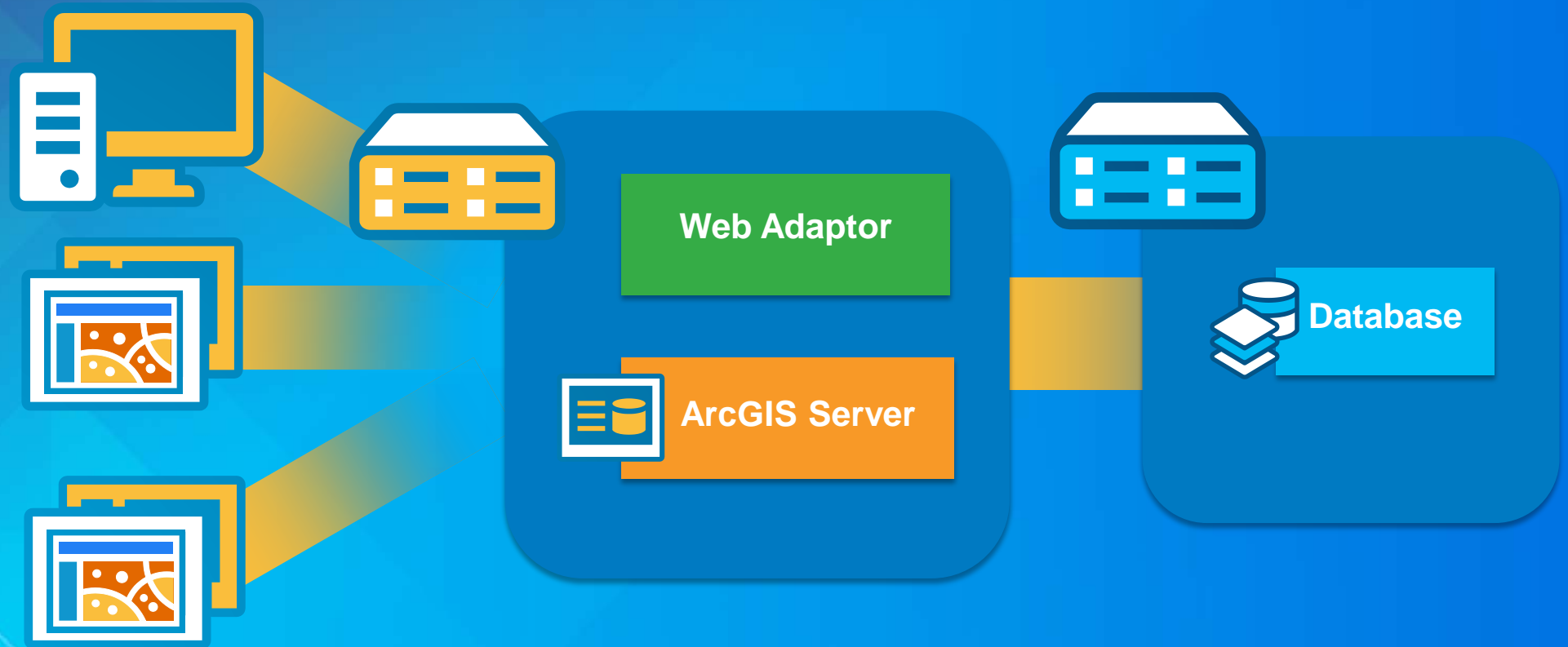
Multi-node WebGIS



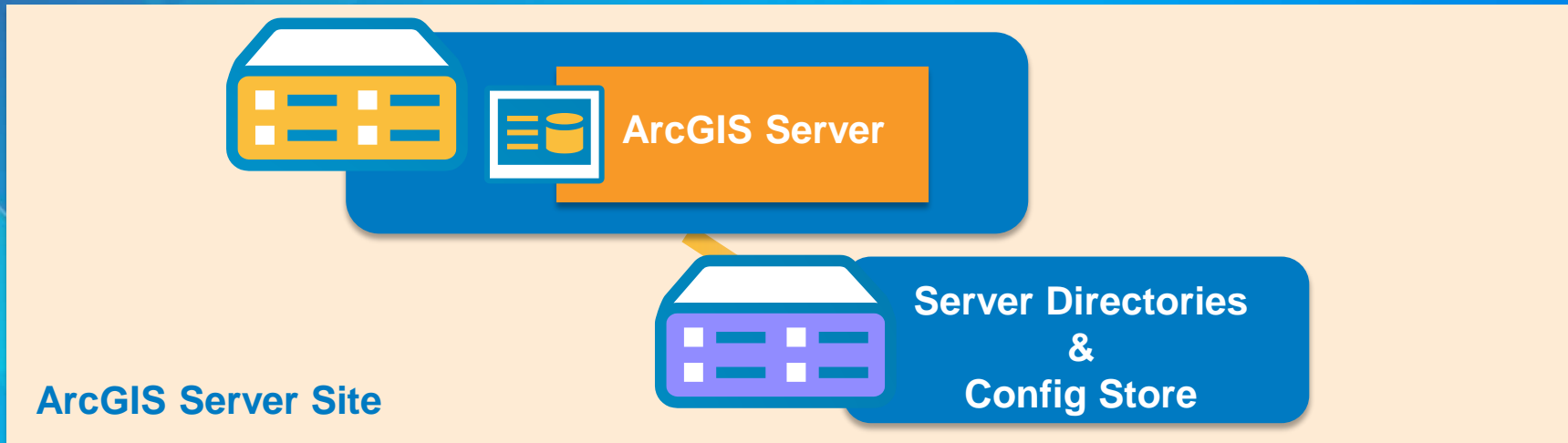
# Critical Services



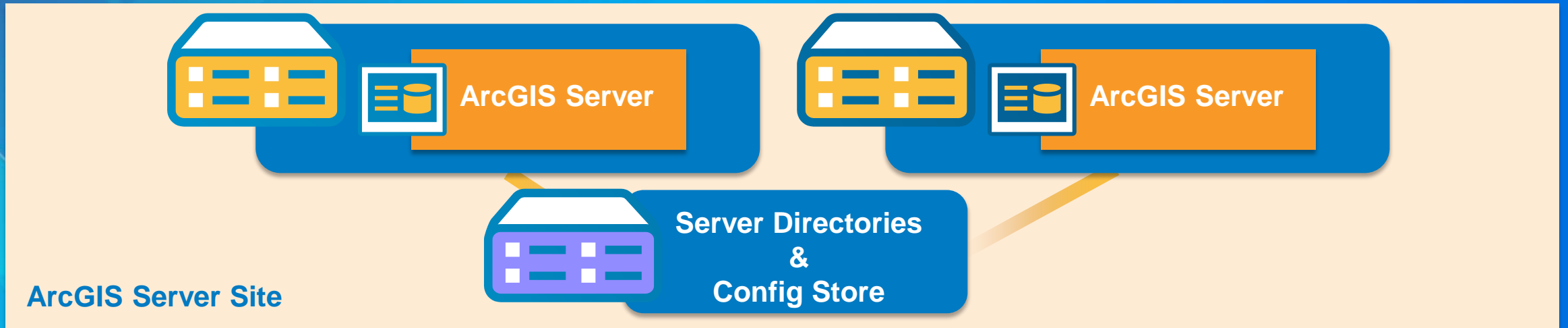
All in one box



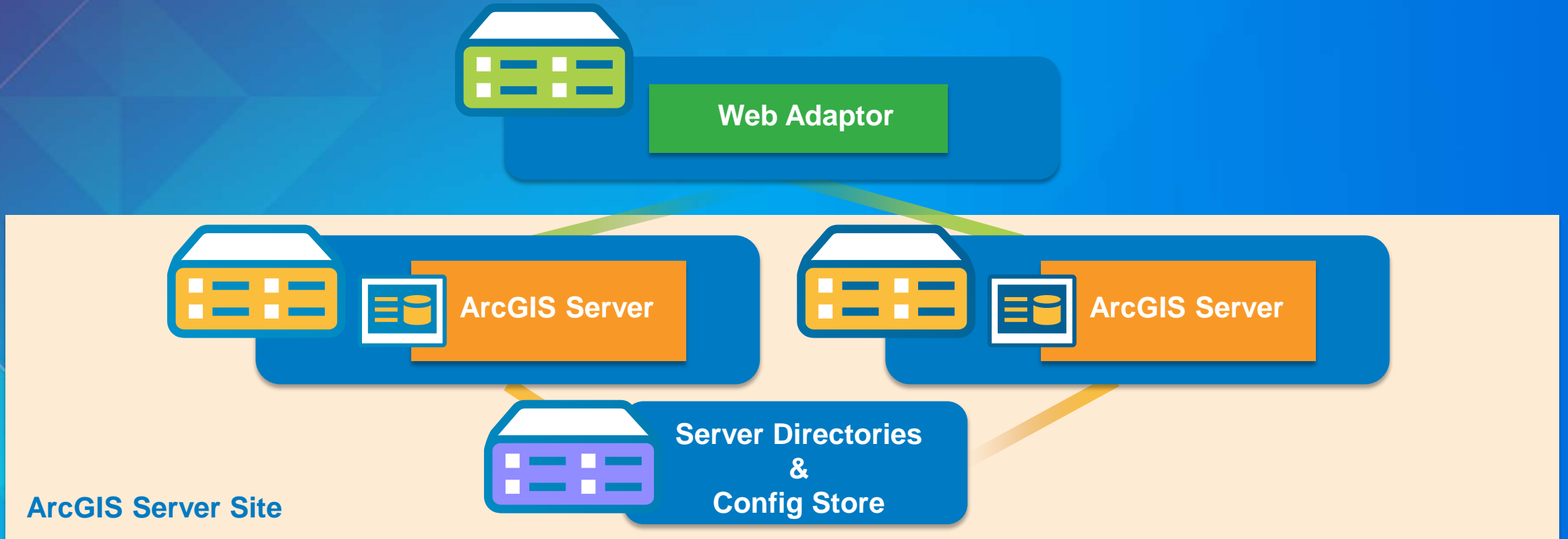
# ArcGIS Server – Multi-node



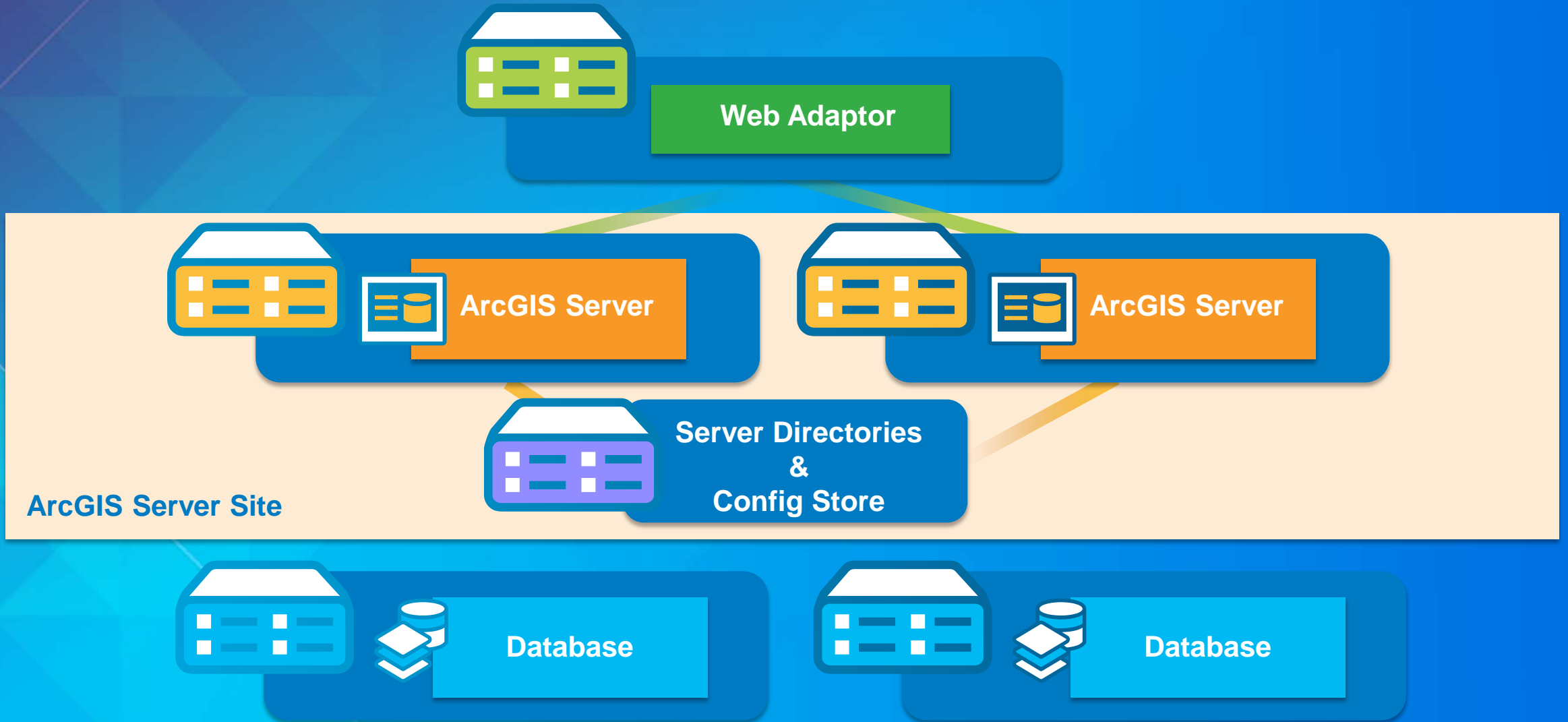
# ArcGIS Server – Multi-node



# ArcGIS Server – Multi-node



# ArcGIS Server – Multi-node



Reference Implementations

# Success!

All in a box server

Multi-node server

Standalone portal

Portal with hosting server

Federation

Multi-node WebGIS

# Organizing Servers

By Function





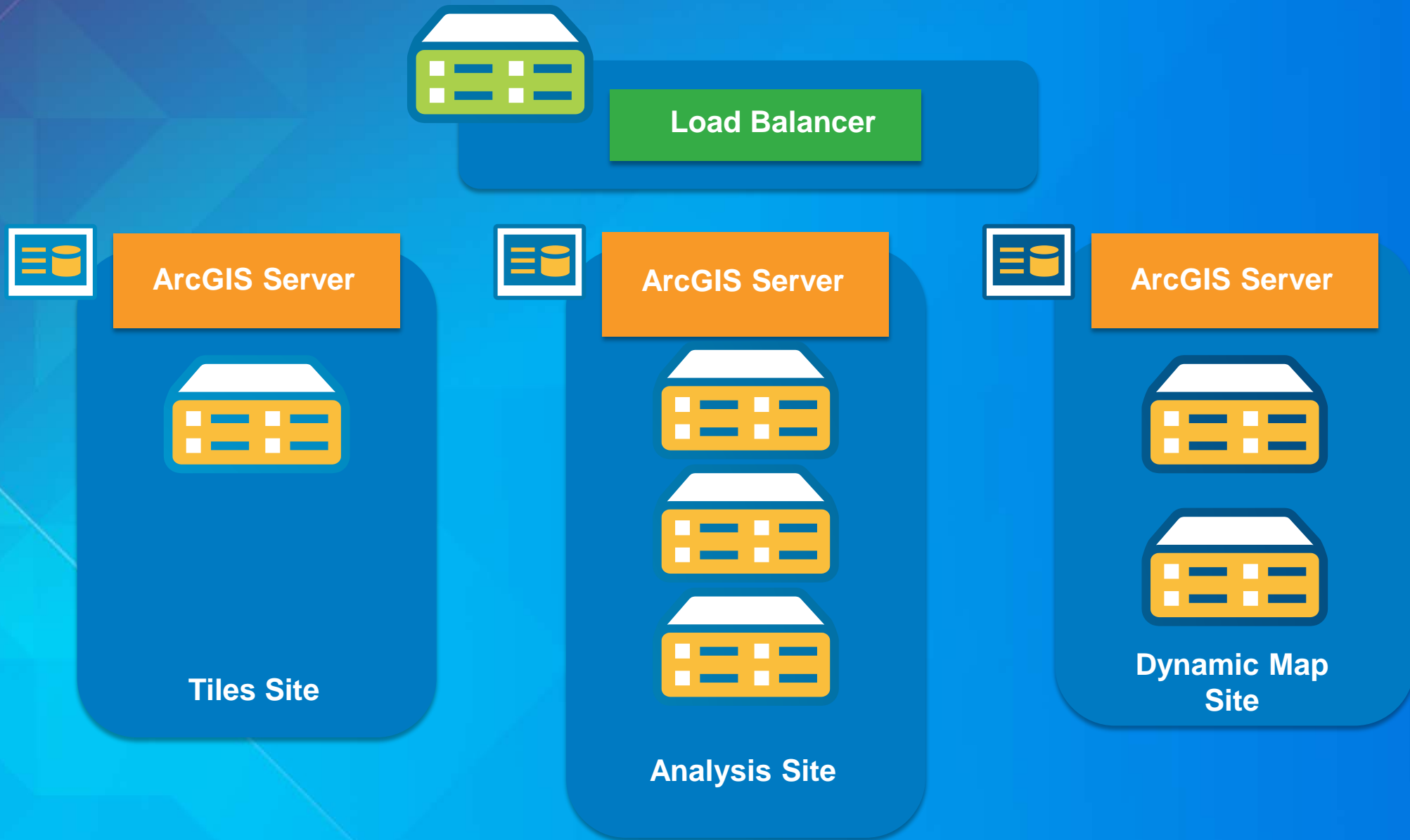
# Separation of workloads



ArcGIS Server



# Separation of workloads

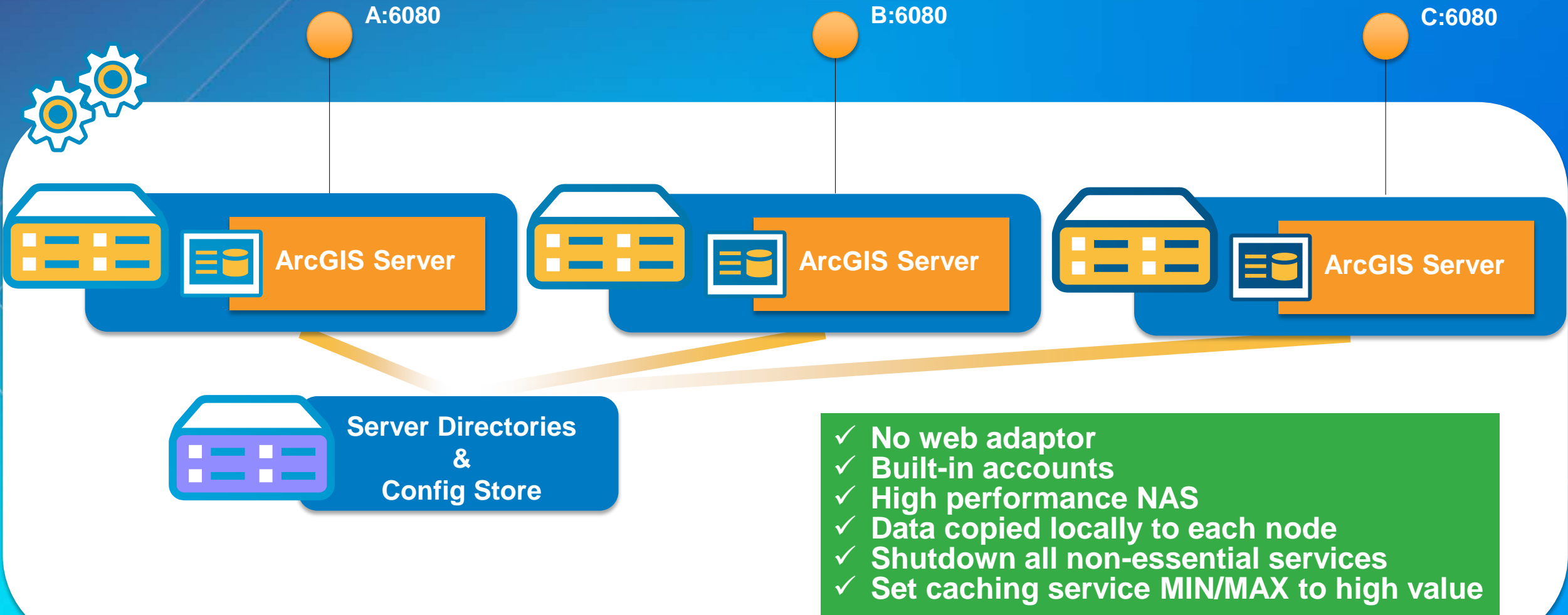


# High performance caching

Frequently cook large volumes of cache  
as fast as possible



# Workload separation – dedicate server for caching



## Reference Implementations

# Success!

All in a box server

Multi-node server with workload separation

Standalone portal

Portal with hosting server

Federation

Multi-node WebGIS

- ✓ Isolation
- ✓ Ease of management
- ✓ Better resource utilization

# Esri releases Portal for ArcGIS

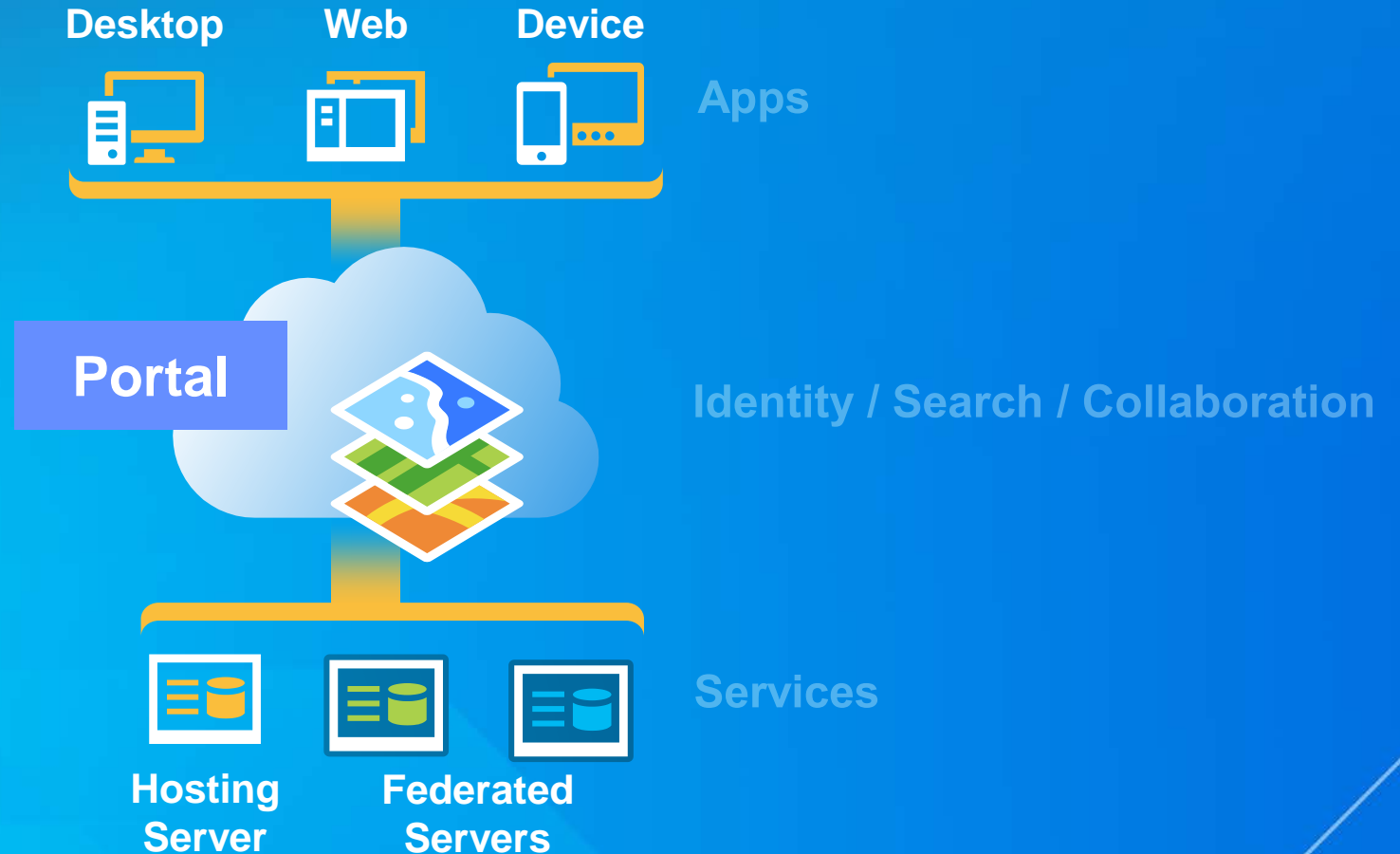
The WebGIS Pattern



# WebGIS

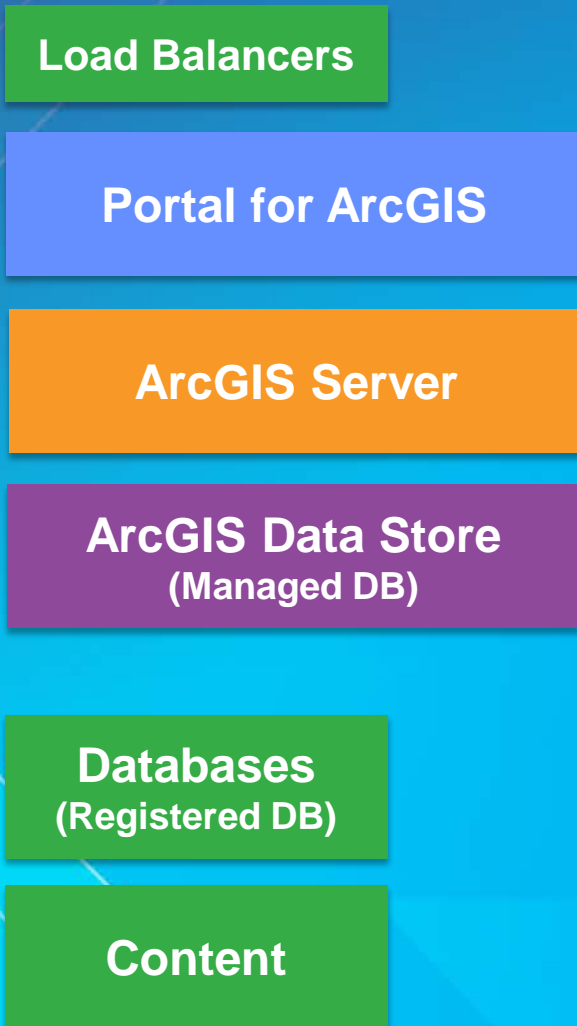
GIS for everyone

- ✓ Powerful layer of abstractions on top of GIS
- ✓ Opens the platform to a large class of applications from desktop to device
- ✓ Single sign-on access to GIS assets
- ✓ Existing GIS infrastructure can be *plugged in*



# WebGIS

## Components



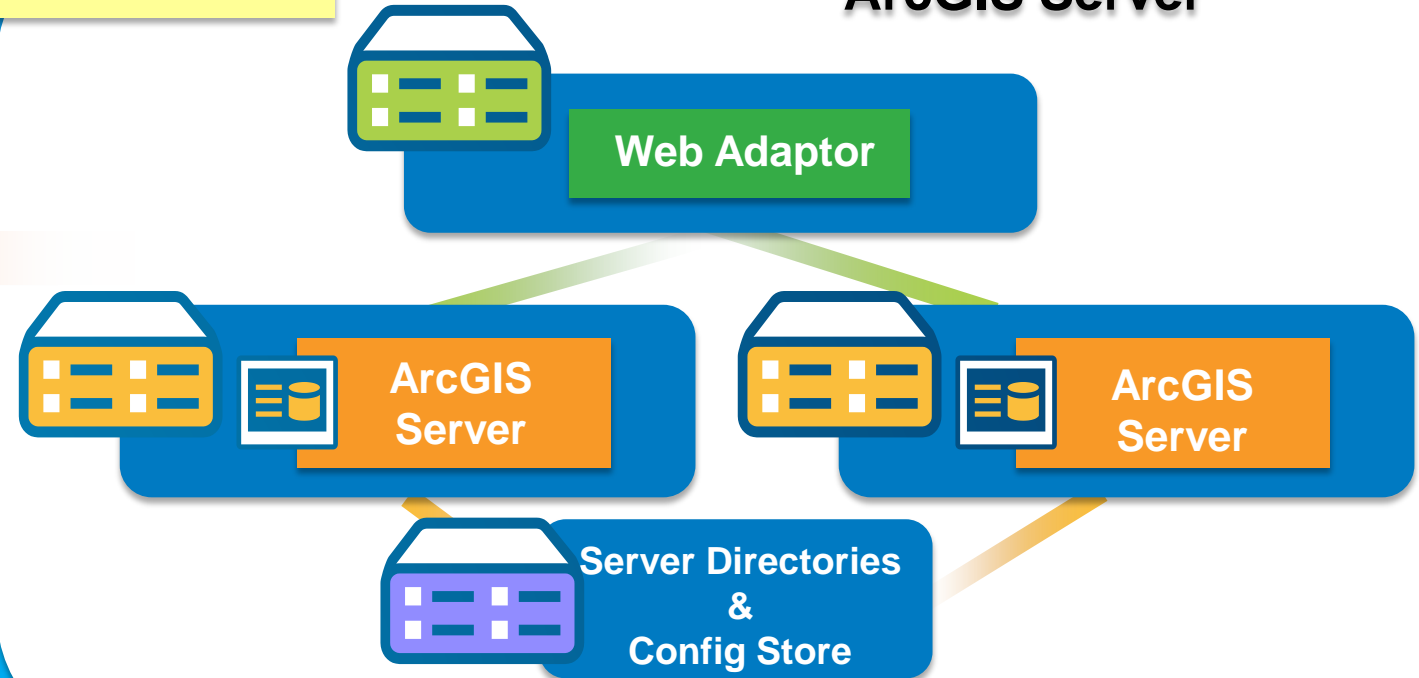


## Standalone portal

Registering GIS services as items in portal



## ArcGIS Server



- ✓ Standalone Portal for ArcGIS allows for making of web maps
- ✓ GIS services become discoverable
- ✓ No change in server

- No single sign-on
- Portal is not highly available

## Reference Implementations

# Success!

All in a box server

Multi-node server with workload separation

Standalone portal

Portal with hosted server

Federation

Multi-node WebGIS

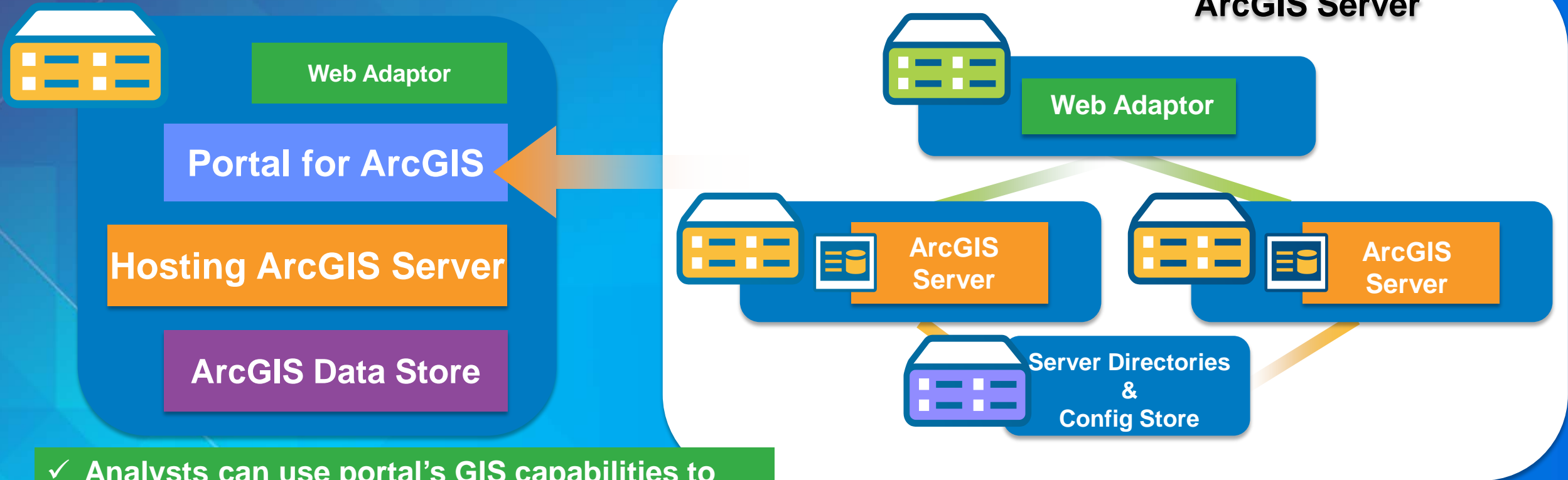
- ✓ Search, find, use
- ✓ Webmap and apps
- No self-service mapping

# Need for self-service mapping

Visualize spatial qualities of business data



## Portal for ArcGIS with hosting server



- ✓ Analysts can use portal's GIS capabilities to map business data
- ✓ Mission critical GIS services registered as items in portal for find and use

- Portal with hosting server is not highly available

## Reference Implementations

# Success!

All in a box server

Multi-node server with workload separation

Standalone portal

Portal with hosting server

Federation

Multi-node WebGIS

- ✓ Search, find, use
- ✓ Webmap and apps
- ✓ Self-service mapping

# Single sign-on

Users don't want to login twice to access  
Spatial content



# Federation

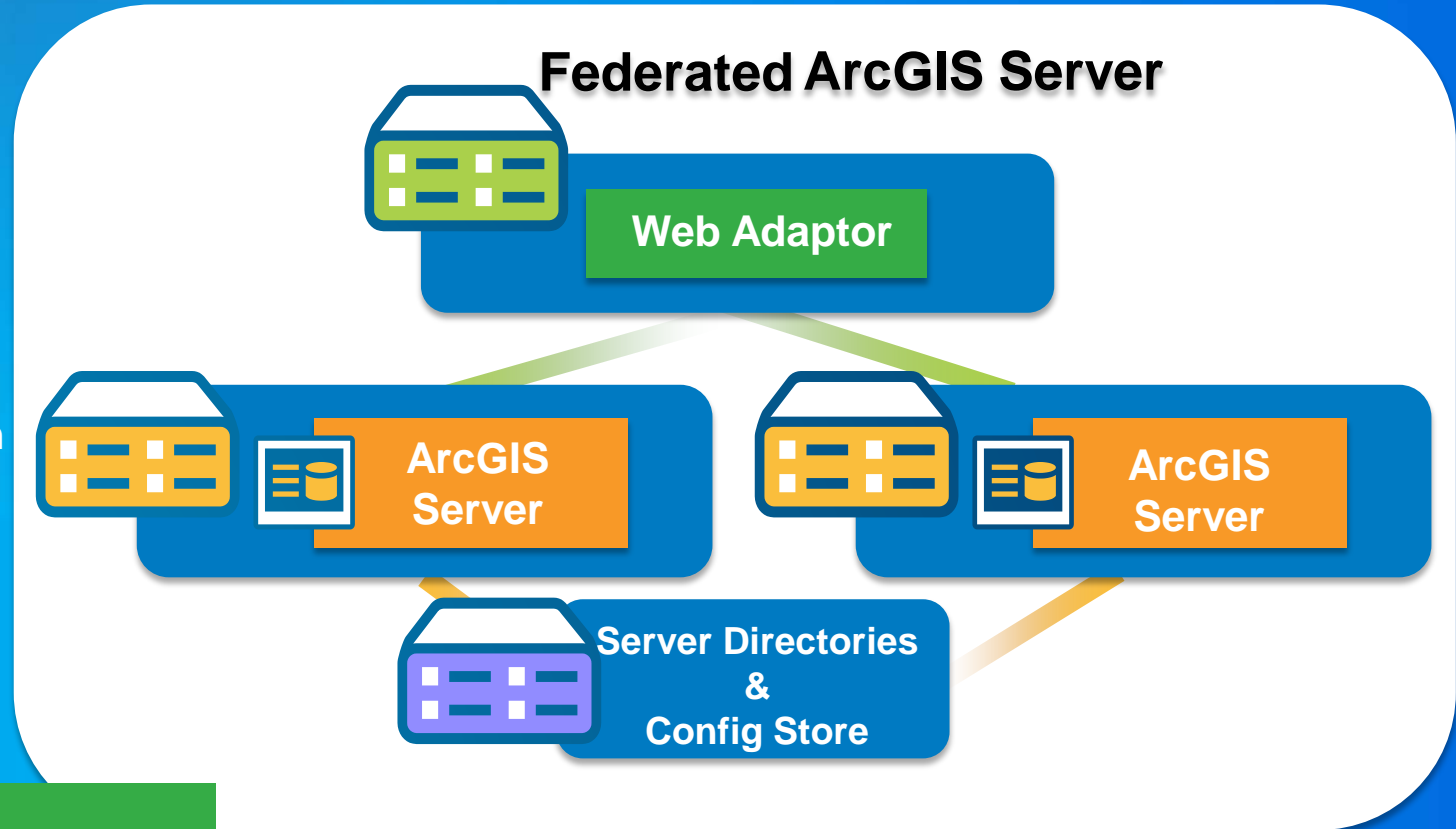
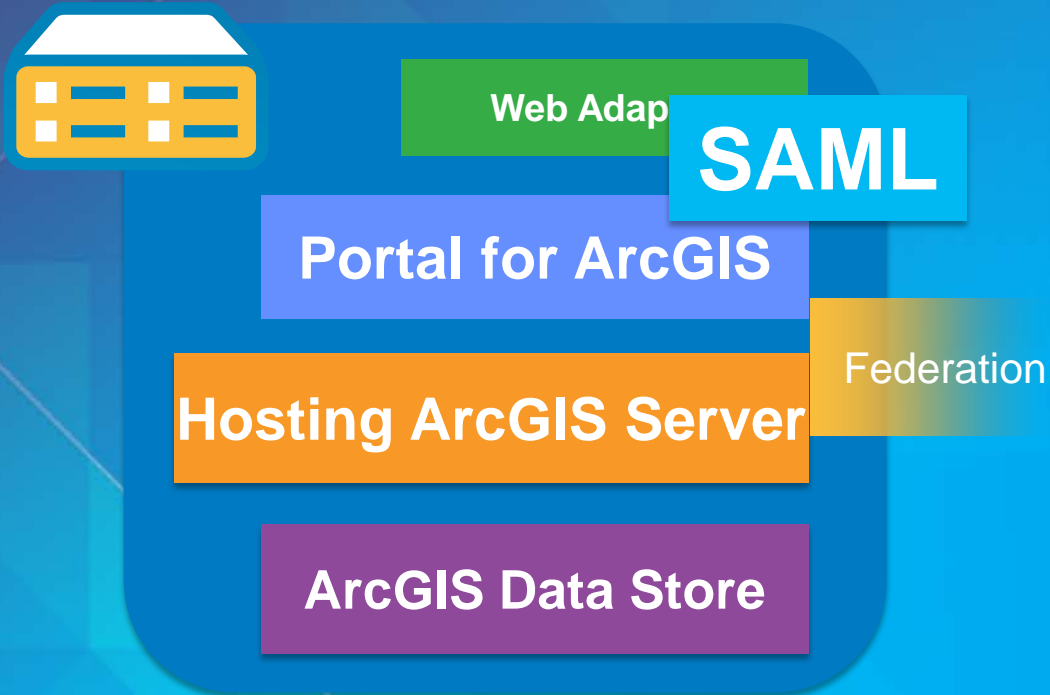
Single sign-on for existing GIS servers

- ✓ GIS servers are connected to portal's identity store
- ✓ Single sign-on for services on a hosting or federated servers
- ✓ Identity flows through the system
- ✓ Ownership and group-based access control

- Need portal accounts for accessing services
- GIS services permissions are changed to portal access control



# Single sign-on with federation



- ✓ Designed for collaboration
- ✓ Search, Find, Use
- ✓ SAML can support mix of identity providers
- ✓ IWA and PKI also available



## Reference Implementations

# Success!

All in a box server

Multi-node server with workload separation

Standalone portal

Portal with hosting server

Federation

Multi-node WebGIS

- ✓ Single sign-on for all web accessible GIS assets
- ✓ Single identity space

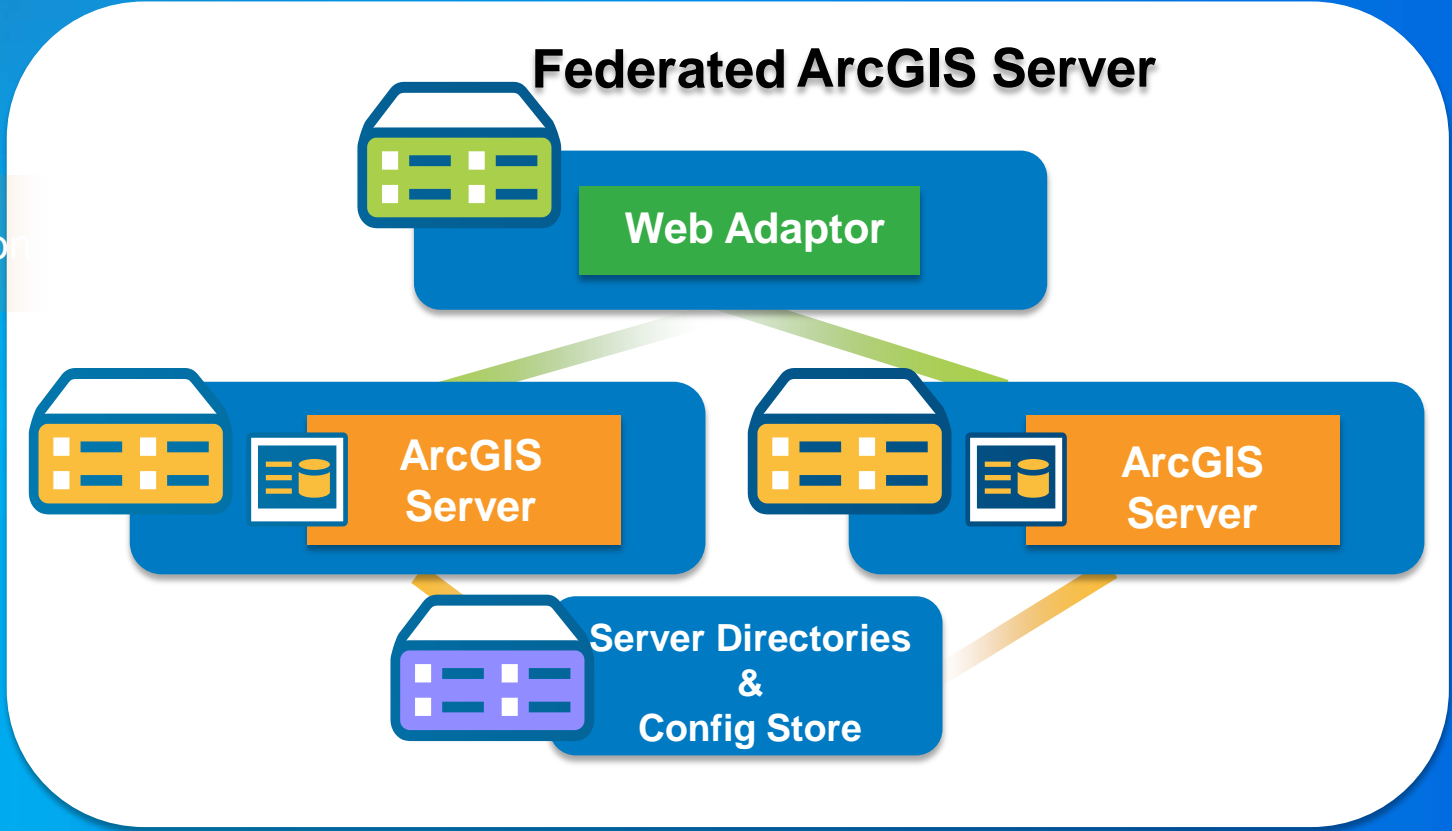
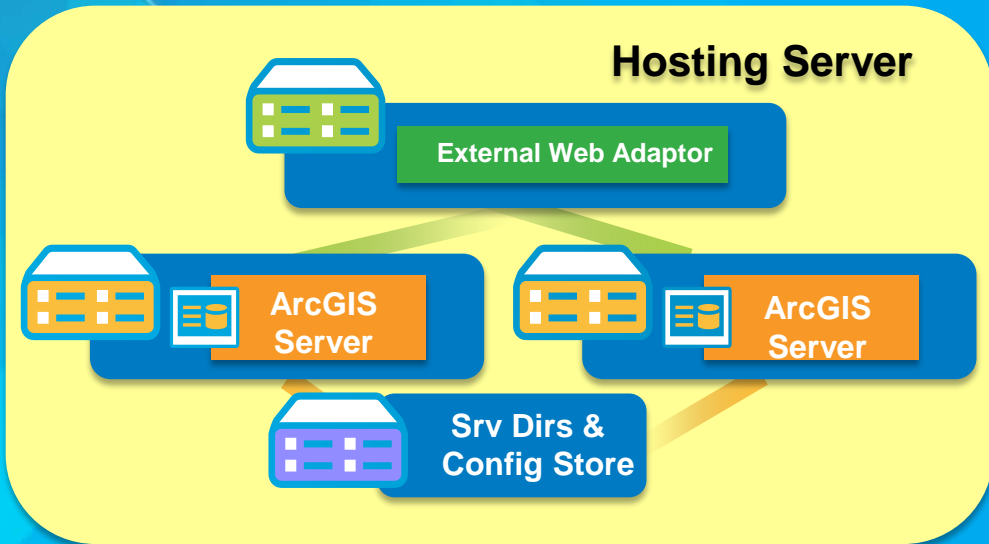
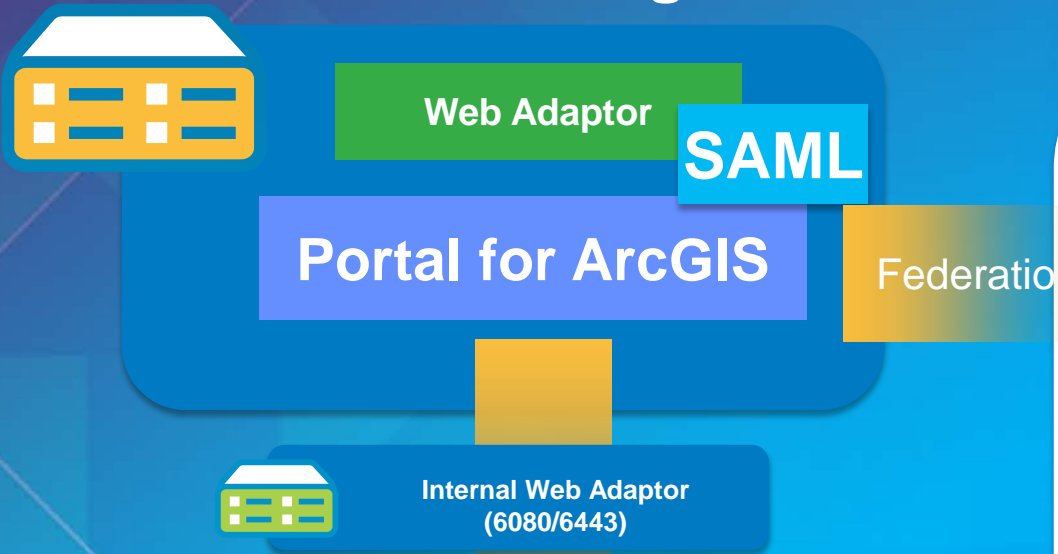
# Hosting server capacity reached!

More hardware needed

**MAXIMUM  
CAPACITY**

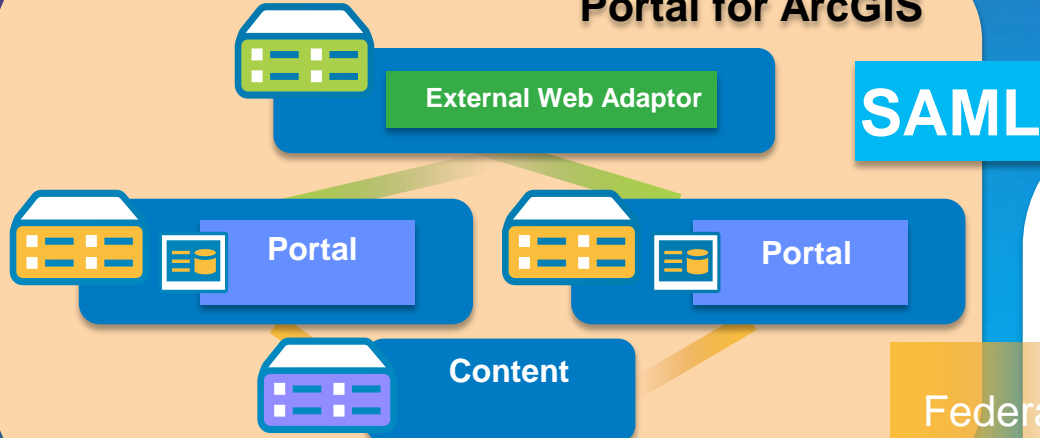


# Multi-node hosting server



- ✓ HA Hosting ArcGIS Server
- ✓ HA ArcGIS Data Store (Managed Database)
- Requires internal web adaptors for portal to reach servers on 6080/6443

### Portal for ArcGIS

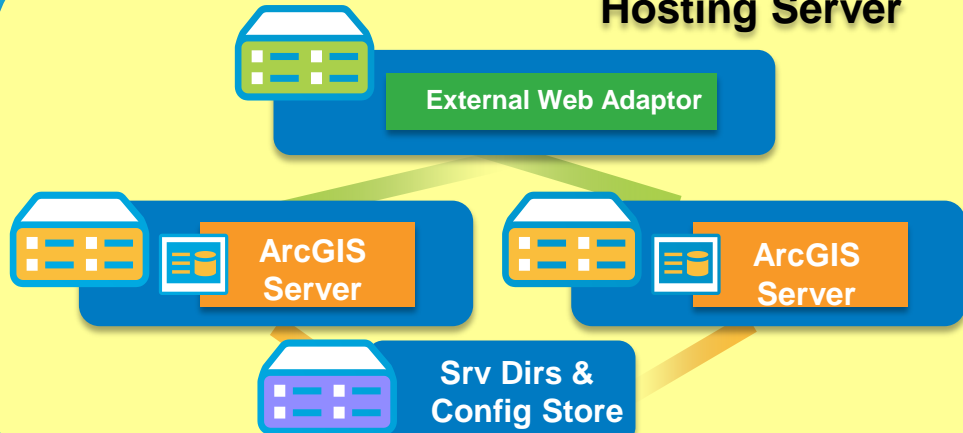


SAML

Internal Web Adaptor For Portal (7080/7443)

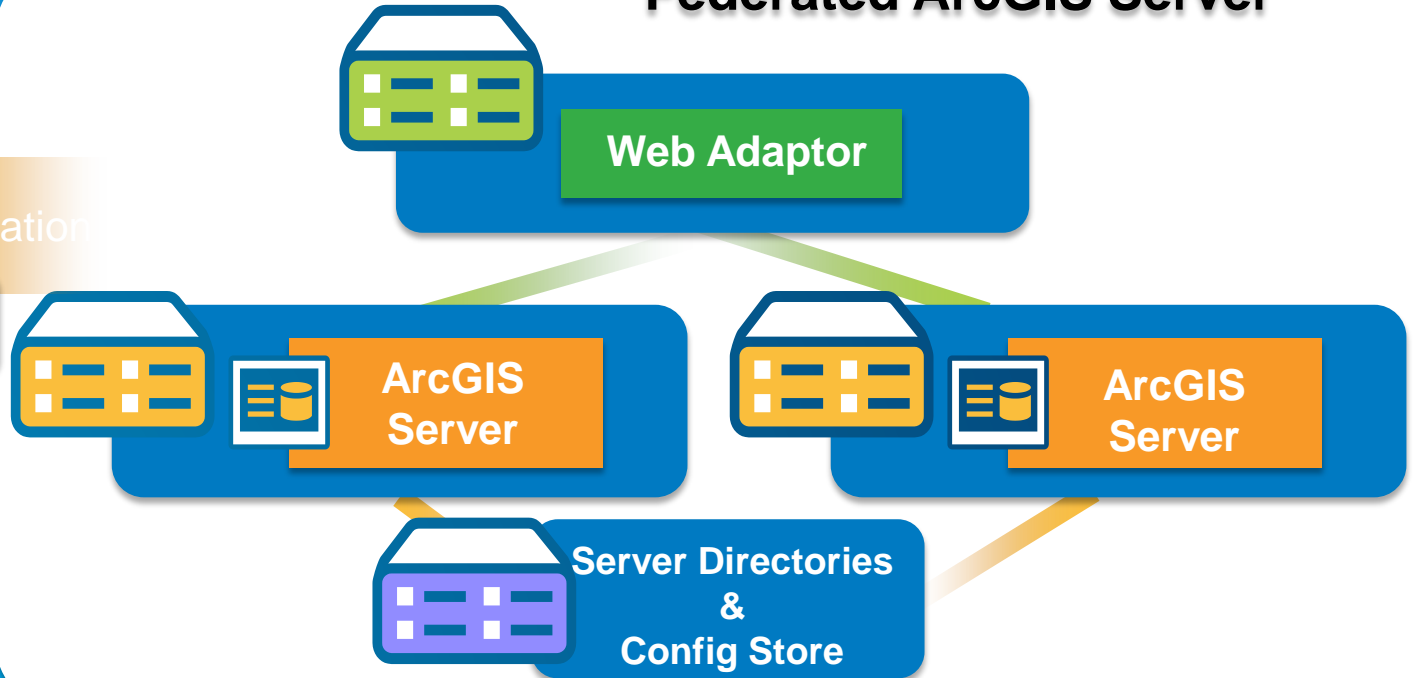
Internal Web Adaptor For Server (6080/6443)

### Hosting Server



## Full WebGIS HA

### Federated ArcGIS Server



Federation

- ✓ HA Portal
- ✓ HA Hosting ArcGIS Server
- ✓ HA ArcGIS Server
- ✓ HA Federation
- ✓ No single point of failure

- Internal load balancers are needed between server to portal and from portal to server
- Not for the faint hearted!

## Reference Implementations

# Success!

All in a box server

Multi-node server with workload separation

Standalone portal

Portal with hosted server

Federation

Multi-node WebGIS

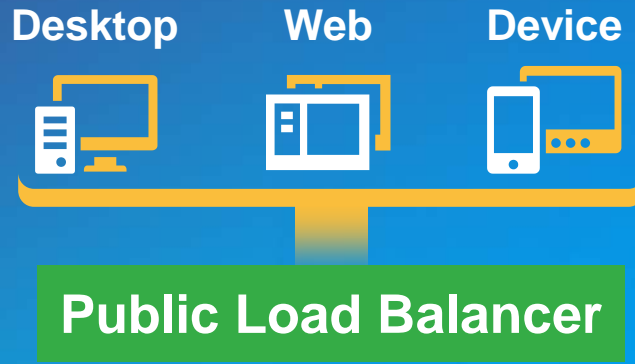
- ✓ No single point of failure
- ✓ Scalable

# In the case of a disaster...

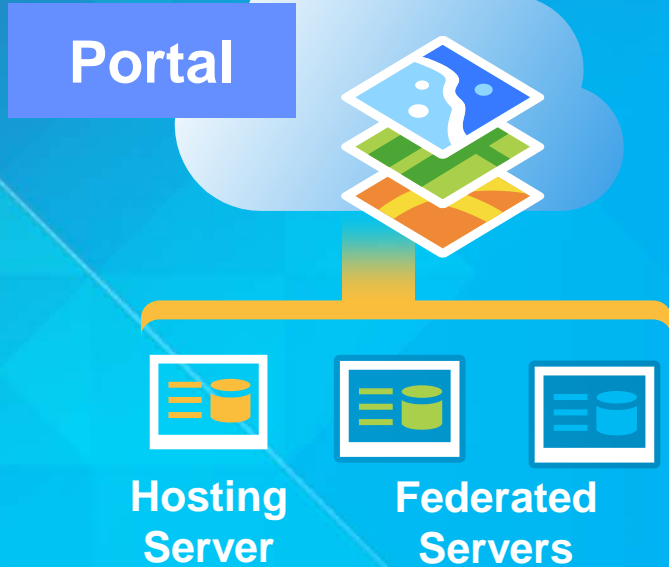
....you really need disaster recovery



# Geographic Redundancy



## ACTIVE

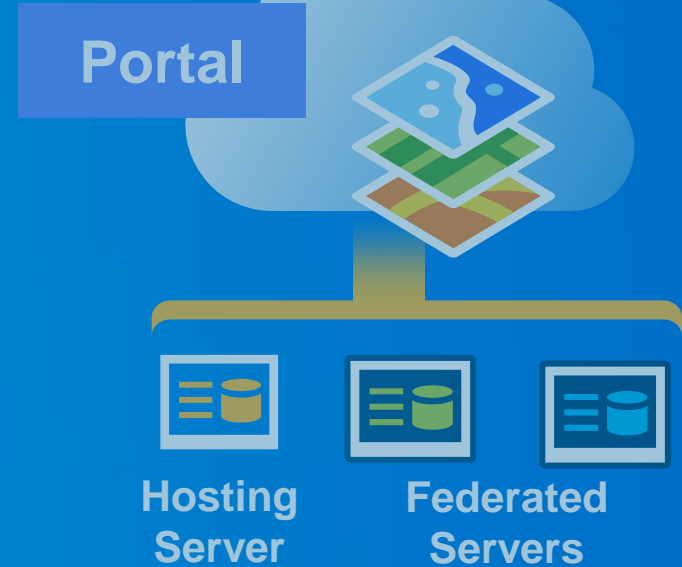


Content synchronization

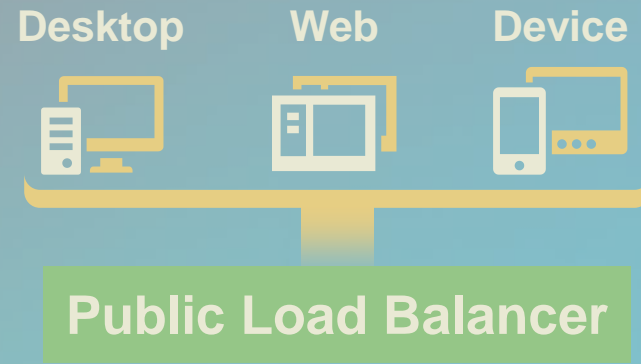
A large orange arrow points from the Active site to the Passive site, labeled 'Content synchronization'.

Portal Server Database Content

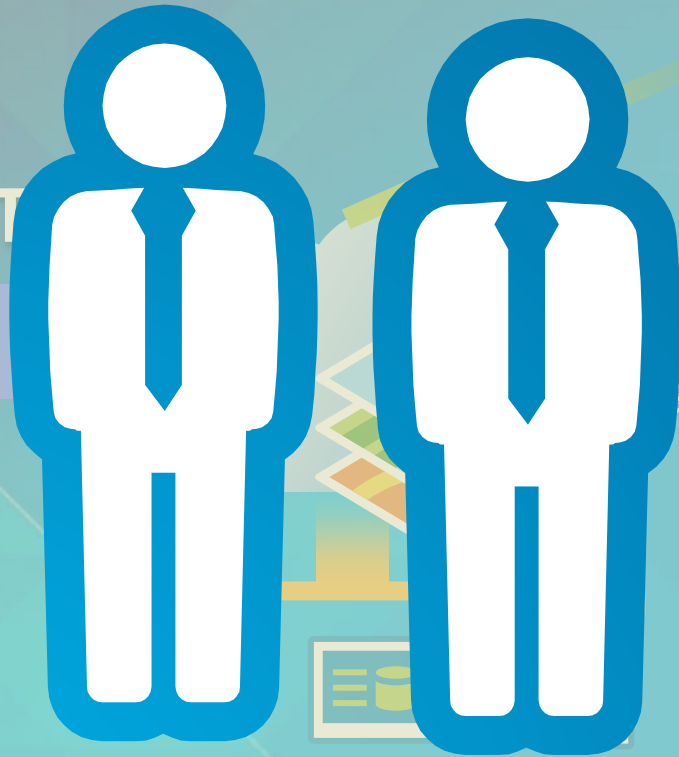
## PASSIVE



# Geographic Redundancy



ACT



SIVE

PO



Hosting Server      Federated Servers



Gillian's journey

# Success! (with a little help)

All in a box server

Multi-node server with dedicated sites

Standalone portal

Portal with hosted server

Federation

Multi-node WebGIS  
with GR/DR

# Summary

**ALL IN-A-BOX**

**SINGLE PORTAL  
MULTI-NODE  
HOSTING SERVER**

**MULTI-NODE  
PORTAL  
MULTI-NODE  
HOSTING SERVER  
MULTI-NODE DB**

**GEOGRAPHIC  
REDUDANCY**

Complexity Vs. Availability



- ✓ Simple
- Single point of failure
- Limited scalability

- ✓ Self-service mapping
- ✓ Simple portal
- ✓ Scalable hosting server
- Single point of failure for portal

- ✓ Scalable hosting server
- ✓ No single point of failure for portal

- ✓ No single point of failure
- ✓ DR

## Parting thoughts...

- **Deployment patterns are a spectrum**
  - Full HA with geographic redundancy is not always required
- **Plan your deployment**
  - Development, staging and production
- **Know your availability and recovery needs**
- **Isolate and manage security**
  - Administrators, publishers, users and custom roles
- **Backup often**





## Other related sessions


- **Building your Server for High Availability and Disaster Recovery**
- **Enterprise Architectures for Large Tiled Basemap Projects**
- **Using ArcGIS Server in the Cloud**
- **ArcGIS Server and Portal for ArcGIS: An Introduction to Security**
- **ArcGIS Server: Advanced Security**
- **ArcGIS Server Performance and Scalability: Optimizing GIS Services**
- **Automating ArcGIS Server Configurations: Chef and the Admin API**


Questions?

**Thank you!**  
Please fill out the session surveys.

< Agenda 

★ My Sched  iCal

**3D Analysis: An Overview**  
Tue Jul 21 8:30 AM - 9:45 AM  
 Map Room 10  
Technical Workshop | 3D and Lidar Data

 Technical Workshop Survey >

Jinwu Ma >

Khalid Duri >

Jie Chang >

3D GIS users are moving beyond visualization and need true 3D analysis to solve problems that



Understanding our world.