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Esri® Business Analyst™ Server System Design Strategies

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Esri Business Analyst Server System Design Strategies

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Esri Business Analyst Server System Design Strategies

Introduction

The purpose of this paper is to help users make more informed decisions when considering the architecture of their Esri® Business Analyst™ Server deployment. This paper supplements the information published regarding ArcGIS® Server performance and scalability recommendations with information that is specific to Business Analyst Server. Links to material regarding ArcGIS Server configuration information will be provided at the end of this paper in the Related Information section. This section will also include links to helpful information regarding Business Analyst Server configuration options.

Introduction to Business Analyst Server

Business Analyst Server is an enterprise solution that enables organizations to make more efficient and consistent business decisions regarding location and market opportunities.

Business Analyst Server integrates easily into enterprise workflows to enable the creation of custom web applications and dashboards that can be used by business professionals in organizations to

- Understand and share information about customers, geographic market areas, business performance, and market potential.
- Make consistent decisions based on this information and specific business rules.

Using the broad mapping and spatial analysis tools and extensive business, demographic, consumer spending, and market segmentation data that ships with Business Analyst Server, organizations can analyze their geographic markets and competition, find optimal sites for new business locations, evaluate success and performance, and perform advanced customer analytics for optimizing sales and marketing campaigns.

Business Analyst Server provides the following benefits:

- **It enables a better understanding of business across your organization** by providing broad access to critical information about customers, geographic market areas, store network performance, and business' potential through easy-to-use, web-based applications.
- **It promotes information sharing throughout the organization** by enabling more people in the organization to get access to the information to make decisions without relying solely on experts and professional analysts.
- **It aids in consistent business decisions** by providing access to web-based tools and workflows that implement consistent processes that are based on specific business rules and current, consistent marketplace data.

- **It provides tools to create informed business decisions** by allowing access to the map-based visualization and analysis tools and marketplace data needed for a clear picture of an organization's business and the geographic market in which it operates.

- **It integrates easily with other business applications (BI, CRM, ERP)** via industry-standard APIs (SOAP, REST, Flex™, and Silverlight®) for rapid development of custom web or desktop applications that integrate with existing corporate data and systems.

Business Analyst Server is an extension for ArcGIS Server for Microsoft® .NET Framework and can be licensed at the Workgroup (for small deployments) and Enterprise levels (for large enterprise deployments).

What Comes with Business Analyst Server?

Business Analyst Server is an enterprise-level solution for sharing and collaborating on geographic business analysis throughout an organization and letting the users get all the benefits delivered with this solution; the package includes the following components:

- Esri Business Analyst Server
- ArcGIS Server Advanced Edition
- Esri Business Analyst Desktop (including Premium Data)
- ArcEditor™
- ArcGIS Network Analyst extension
- Address Coder™
- Esri Data (available with both Business Analyst Server and Business Analyst Desktop setups)

With Business Analyst Server, Business Analyst Desktop users now have a mechanism to publish and share analyses and models between departments, enabling collaboration and more informed decision making. Users in organizations operating in different geographies with varied population demographics can adapt models and analyses to local conditions. Analyzing markets and competition, evaluating new and existing locations, and performing customer analytics may sound familiar to longtime Business Analyst Desktop users. Whereas before, analysis models may have existed in silos on individual desktop computers, users now have the ability with Business Analyst Server to publish their analyses to the rest of the team, regardless of the physical location of individual team members.

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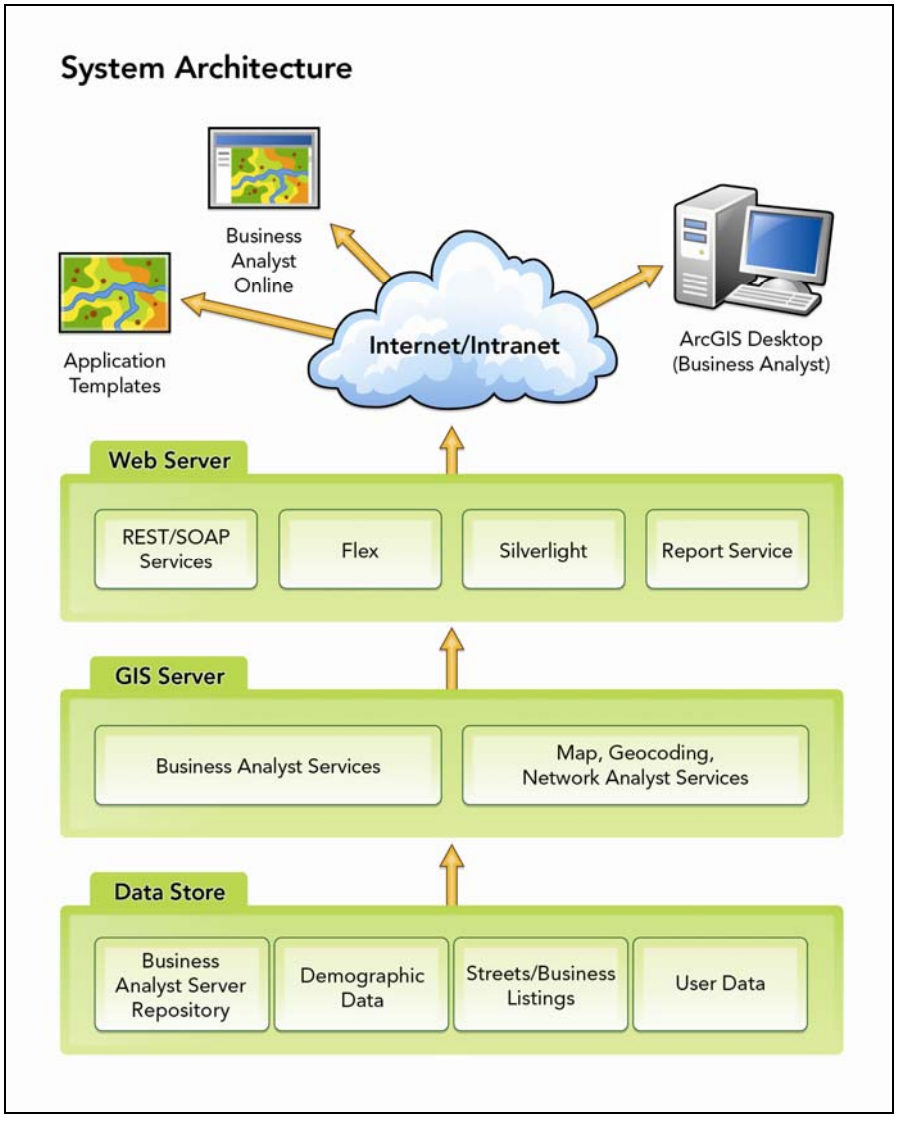
The Business Analyst Server architecture consists of three main components as shown in the image below:

1. ArcGIS Server is the geographic information system (GIS) server that has been extended to allow Business Analyst map services. Standard ArcGIS Server services, such as map, geocoding, and geodata services, etc., are also available.

2. The web server will host Business Analyst web applications to allow users to consume the Business Analyst Map Service and the Business Analyst Server Report Service, which enables business report publishing.

3. The Data Store will contain Business Analyst Server data, including Esri Demographic Data, Infogroup business listings, StreetMap™ USA, a directory for user data, and the Business Analyst Server Repository.



Supported Platforms and System Requirements

Business Analyst Server is supported on the Microsoft Windows® platform, and future release plans include support of all core ArcGIS Server platforms.

Currently supported Windows platforms are

- Windows 2003 Service Pack 2 (SP2) (32 bit) Server Standard, Enterprise, and Data Center
- Windows 2003 SP2 (64 bit [EM64T]) Server Standard, Enterprise, and Data Center
- Windows 2008 (32 bit) Server Standard, Enterprise, and Data Center
- Windows 2008 (64 bit [EM64T]) Server Standard, Enterprise, and Data Center
- Windows Server 2008 R2 (64 bit [EM64T]) Server Standard, Enterprise, and Data Center

System requirements depend on the intended use of Business Analyst Server, the expected load, and the number of simultaneous users. To provide high performance for Business Analyst Server functionality, the recommendations regarding the random access memory and CPU are

- Minimum: RAM 4 GB/Dual core @ 3 GHz
- Recommended: RAM 8 GB/Quad core @ 3 GHz

Organizations with a large number of Business Analyst Server users will want to consider more than the minimum requirements. As a guideline, Esri recommends up to four users per processing core in addition to thorough testing of the expected workload and server performance before deployment.

The disk space requirements depend on the amount of custom user data, number of simultaneous users, and use of the Business Analyst Server system. As a minimum, the 20 GB disk space is required to store Esri Demographic Data and streets and business information, and at least 30 GB or more is recommended for the repository where the analysis results, trade areas, and reports will be saved.

Scalability and Configuration Options

Scalability allows growth in size or complexity without showing negative effects and provides confidence in the abilities of the software. Problems in this area may expose the enterprise to operating inefficiencies and potential general failure of critical business components. The Business Analyst Server system can be configured in many ways. The simplest way is to run all the components of Business Analyst Server on a single computer (small configuration). Another configuration would be to place all Business Analyst Server components on one machine and, for instance, install the data on another machine (medium configuration). It is also possible to distribute the various components across multiple computers (large configuration).

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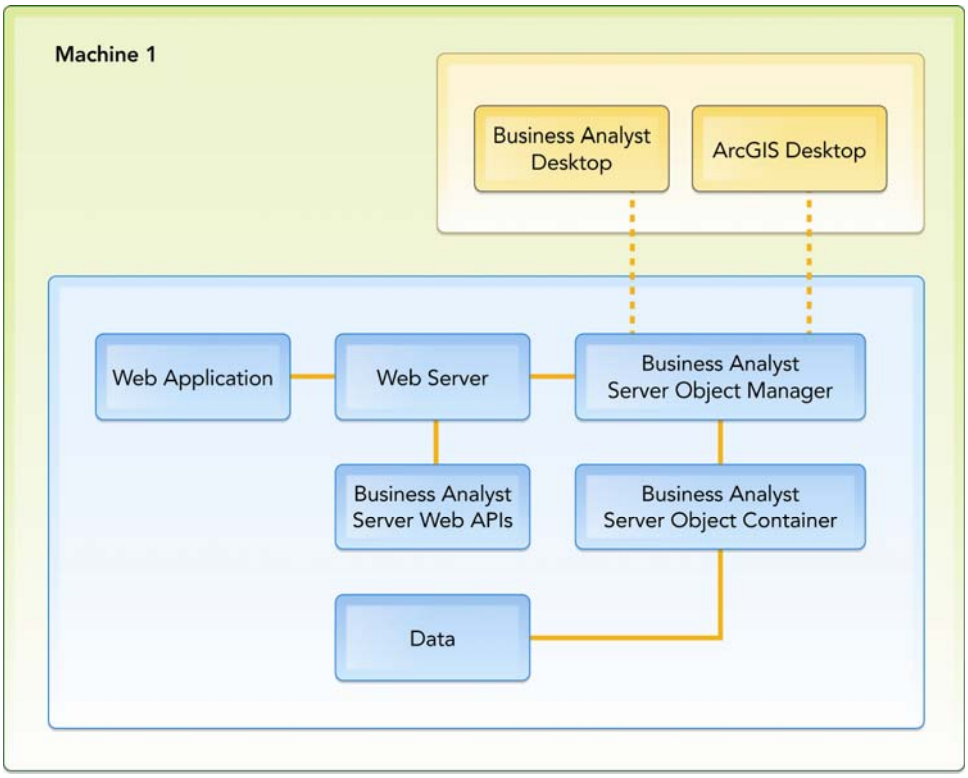
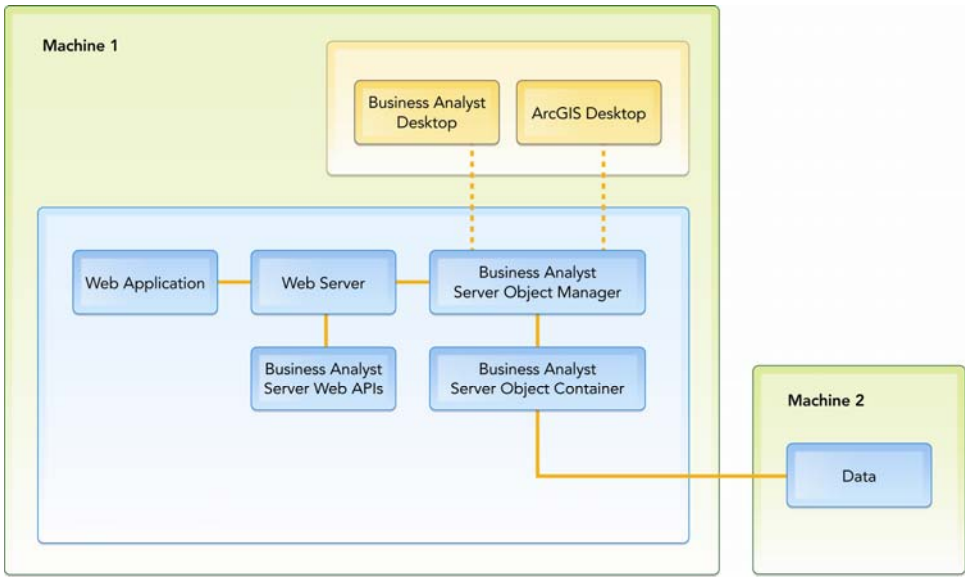
Configurations will vary depending on the needs of the organization, the available computing resources, and the intended use for Business Analyst Server. Recommended platform sizing and system configuration strategies are provided in the Esri System Design Strategies technical reference document.

Each organization will need to configure its system based on its intended usage and the number of simultaneous users. Developers that intend to use the Business Analyst Server system to build and prototype applications can install all the components on their development computer, which is a single server. Or if the anticipated number of simultaneous users of ArcGIS Server is low, they can run the entire system on one computer, which is a typical small configuration as described in the image below.



Higher-volume usage of the Business Analyst GIS server and its web applications should be distributed across several computers. The configuration in the diagram below illustrates all components on one machine as in the previous configuration but with one difference—the data is installed on a separate machine.



To achieve a configuration like this, follow the procedure below:

1. Run the Business Analyst Server Data 2010 installation from the server object manager (SOM) machine using the browse option to point the installation to a location on another machine.

2. Run the Business Analyst Server Setup on the server object manager machine and install all features locally.

Another possible medium-sized Business Analyst Server configuration is when the three-tier architecture is applied:

- Web server: Business Analyst Server Web APIs and web applications

- Application server: Business Analyst Server SOM/server object container (SOC) components

- Data server: Business Analyst Server data and user data

The advantage of a three-tier configuration is that there would be one machine dedicated to the database, one dedicated to the logic, and one dedicated to the presentation, as shown in the picture below. This helps improve scalability and performance.

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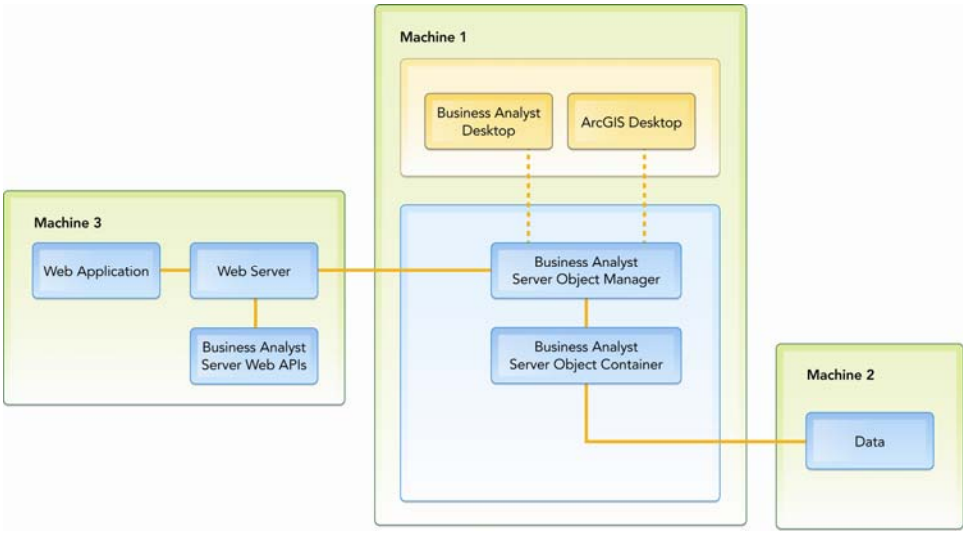


To achieve a configuration like this, the following steps are recommended:

1. Follow the procedures outlined in the ArcGIS Server Online Help document, Configuring a multiple-machine deployment.

2. After setting up a multiple-machine deployment of ArcGIS Server, run the installation for the Business Analyst Server data from the server object manager machine and browse to install the data on another machine.

3. Once the data has been successfully installed, run the Business Analyst Server Setup on the server object manager machine, only installing the Business Analyst server object manager, the Business Analyst server object container, and the Business Analyst Server Desktop components (optional).

4. Run the Business Analyst Server Setup on the web server machine to install the Business Analyst Server web applications and HTMLextReportService.

An example of a large-scale configuration of Business Analyst Server is the configuration used by Esri Business Analyst Online℠. Business Analyst Online is a web-based application that delivers on-demand reports, maps, and market analyses of demographic, consumer, and business data and is used by retailers, real estate professionals, and local governments to understand where to locate new businesses, advise others on location-based decisions, or determine where to best market products and services.

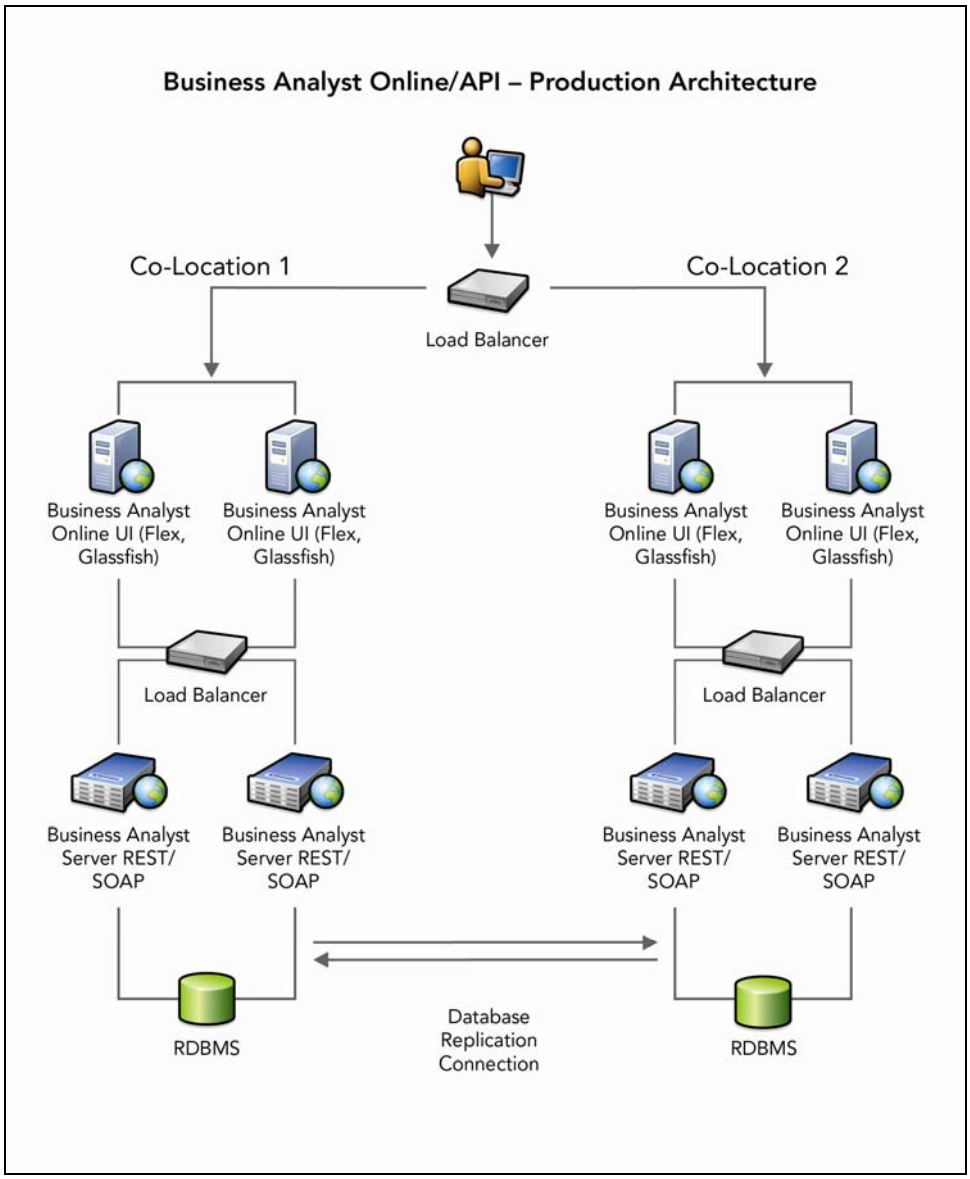
The Business Analyst Online system architecture is composed of many servers at Esri's corporate location and at an off-site location. Each data center consists of the following:

- Two front-end web servers that handle all unique identifier (UI) and ordering components

- Two back-end application servers that handle the ArcGIS/Business Analyst Server components including Business Analyst Online API

- One database machine using Oracle that handles all customer-based information for reports, site analyses, and subscriptions

The system is globally load balanced to handle up to 10 concurrent users per back-end application server. The load balancing uses a round-robin formation and places users into the next available machine based on load. Business Analyst Online API has the same load balance. The image below illustrates this configuration:



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Development Environment and APIs

Business Analyst Server provides REST and SOAP services as well as rich Internet application (RIA) web APIs in Flex and Silverlight to programmatically leverage the rich data and powerful analysis for integrating business logic with GIS in an enterprise environment. The Flex and Silverlight Web APIs allow users to easily and rapidly build dynamic and rich client-side applications using the same functionality that is in the Business Analyst Server REST services. For more information regarding developing with Business Analyst Server APIs, see Developing with Business Analyst Server.

Release Cycles and Technical Support

Business Analyst Server provides one major release and two service packs per year. The major release includes a data update that seamlessly integrates into the software application to update information on reports. To get the latest information regarding releases from the Business Analyst Server team, visit the Business Analyst Server Resource Center.

For help regarding a technical issue, Esri Technical Support can provide assistance in getting Business Analyst Server up and running along with help in software installation and configuration, functional use of the software, interfacing the applications with hardware, requesting product enhancements, and reporting software defects.

First-year maintenance is also included in the license of Business Analyst Server. Maintenance includes technical support, updates, and many other benefits. Members of the Esri Business Analyst Server community have access to the online blog, scripts, technical articles, and other content. One of these valuable sources of information is the Business Analyst Server Resource Center, a central repository for accessing user and developer documentation, presentations, demos, and white papers along with other information.

Related Information

ArcGIS Server Performance and Scalability—Performance Factors and Optimization

Configuring a Multiple-Machine Deployment of ArcGIS Server

Performance Considerations for Services

Load Balancing Performance Factors

Network Performance Factors

Business Analyst Server Installation and Configuration Knowledge Base

About Esri

Since 1969, Esri has been helping organizations map and model our world. Esri's GIS software tools and methodologies enable these organizations to effectively analyze and manage their geographic information and make better decisions. They are supported by our experienced and knowledgeable staff and extensive network of business partners and international distributors.

A full-service GIS company, Esri supports the implementation of GIS technology on desktops, servers, online services, and mobile devices. These GIS solutions are flexible, customizable, and easy to use.

Our Focus

Esri software is used by hundreds of thousands of organizations that apply GIS to solve problems and make our world a better place to live. We pay close attention to our users to ensure they have the best tools possible to accomplish their missions. A comprehensive suite of training options offered worldwide helps our users fully leverage their GIS applications.

Esri is a socially conscious business, actively supporting organizations involved in education, conservation, sustainable development, and humanitarian affairs.

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