COGILITY™
SOFTWARE

Cogility Studio™ Enterprise Class Integration and Composite Application Platform

WHITE PAPER

Cogility Studio provides an Enterprise class platform for integration and composite application development. This white paper addresses six challenges critical to an enterprise effort and in each instance describes Cogility Studio's related solution .

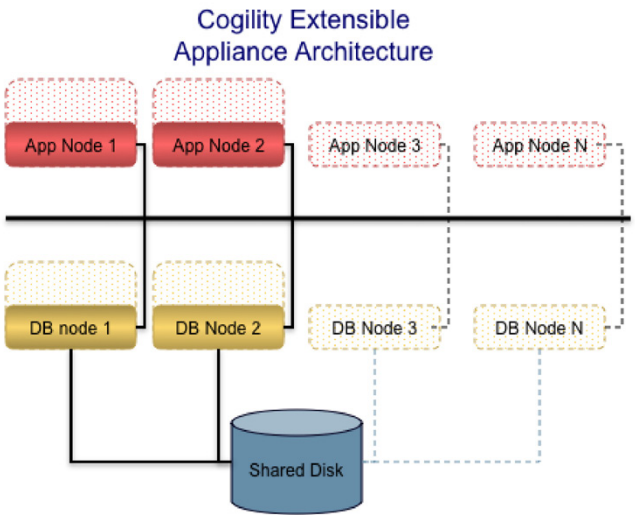
These challenges are:

- Scalability
- Security
- Integration with existing infrastructure and existing applications
- Support for custom logic and policies
- Deployment to datacenter environments
- Flexible licensing models to meet enterprise needs

In addition to the above, Cogility Studio also excels at producing high ROI and enables accelerated time to market through iterative and rapid deployment of a system. These benefits are achieved through a consistent and enforced higher level of abstraction throughout the development process. This aspect of Cogility Studio is covered in the final section of this white paper.

Scalability

As in any application environment, scalability in Cogility Studio can be defined many ways. Scalability can be optimized for short transactions, or long ones; and for throughput or response times. These tradeoffs affect everything from the hardware to the software selected. Cogility Studio was architected to give each organization maximum flexibility to address these varying needs. Cogility Studio sits on top of industry standard application servers and relational database systems, and can be hosted by a wide selection of operating systems.



Cogility Studio is architected to allow virtually any number of application servers running Cogility Studio to front end the same logical database without any single point of failure or contention. The business logic executing in the application server is stateless, allowing full horizontal scalability of the application logic and full utilization of multi-core processors. Oracle Real Application Clusters (RAC) can be used to add additional physical databases that further scale the database aspects of a deployment to meet massive scalability goals. For larger installations the use of SAN storage networks and SSD storage is recommended to reduce physical access times in transactional oriented applications.

Security

Cogility Studio appliances ship in a standard configuration with the Sun Microsystems Trusted Solaris Operating System and uses industry standard interfaces in conjunction with the WebLogic Enterprise Edition application server to support SSL security,

and application access controls. Cogility Studio goes further, allowing web service interfaces to support handlers that add additional security as required for DoD level systems security. In addition to access controls and transport security, application level security allows use of roles and user logins to further control access to interfaces and to data content on behalf of a user. Integration with existing security systems such as LDAP user databases further supports security aspects by keeping security control centralized and updates timely.

Integration with Existing Infrastructure and Existing Applications

Cogility Studio is designed from the ground up to support integration in an enterprise class environment. This requires support for access to existing databases, existing applications, and existing infrastructure. Cogilty Studio supports direct access to existing databases; access to web service, HTTP/REST, and JMS interfaces; and supports direct access to any java library allowing for any custom or legacy interfaces that can be accessed from java. Cogility Studio can further support external interfaces via adapters that can be written in any language and support any technology interface requirements.

In addition to API integration, Cogility Studio has the ability to integrate directly with existing databases. Cogility Studio includes a table discovery tool that reports the schema of existing databases, and allows tables and columns to be activated. Activating a table or column allows attaching business logic to modifications to the database making the existing database a source of events. The activation of a database is through triggers and does not modify the existing database or schema.

Support, Custom Logic and Policies

One thing that differentiates an enterprise environment from smaller business environments is the need to incorporate custom, logic and policies. This is often couched as “configuration” of an application to a customer’s needs. Cogility Studio is first and foremost a development environment, making introduction of custom, logic and policies natural and straightforward. Logic may support on-going asynchronous processes, decision making within the interactions of the interface to an external or existing system, or in the access and presentation of information in a web GUI. The same environment is used to author all business logic within Cogility Studio and is based on the industry standard OMG Action Semantics specification. The authoring of asynchronous processes uses OMG UML State Machine notation for complex even driven processing and workflow. Because Cogility Studio employs object oriented business logic, it can be specific to a type of “object” (customer type, data source, case file or investigation type). This ability, to have unique behavior attached to data, sets Cogility Studio apart in the composite application space, and provides great flexibility to the enterprise to attach logic and policies where they are naturally applicable. Being based on the OMG UML modeling language gives the developers and users more flexibility and expressive power than is present in data integration and orchestration systems such as BPEL and BPMN, and provides a much more readable environment than programming languages like Java or C#.

In addition to the expressive power of the system, tools are provided to allow the logic to be visible while ensuring it is bound to the execution logic. This allows generation of documentation directly from the model that is executing (documentation is never out of date), and allows generation of overview graphics (system view diagram, class diagram, etc). This ensures that technical, business, and end-user stakeholders are all seeing the same system and that what they see is guaranteed to be what is executing.

Deployment to Datacenter Environments

Cogility Studio anticipates enterprise datacenter environments by separating the deployment information from the application and integration logic. The same application can be deployed to several environments (development, test, and production), and to several app server instances (clusters or physical locations), while keeping the application unchanged. This deployment flexibility and adaptability makes Cogiltiy Studio well suited to the enterprise. In addition to physical deployment support, Cogility Studio was built to support the demanding needs of enterprise operations. This includes 0% downtime for logic changes that do not impact the external interfaces of an application, support for concurrent use of old and new schema during a rolling deployment to further reduce impact on operations, and allows recovery from deployment issues and updates.

Flexible Licensing Models to Meet Enterprise Needs

The preferred method for deploying Cogility Studio is an appliance model where Cogility Studio, all required third party software[1] and hardware can be delivered in a pre-configured integrated offering saving the customer licensing and configuration costs. This bundled offering can greatly reduce software licensing over ala cart pricing (The Cogility Studio appliance model might cost less than the retail price of the bundled third party software licenses *alone*).

For enterprise needs, both software-only, and custom deployment targets can be supported. Integration into existing operations, and use of existing operational skills, often determines the operating environments. The use of standard application server interfaces and databases allows great flexibility in configuring custom solutions where required.

ROI and Rapid Deployment

Cogility Studio is based on the OMG MDA architecture, and takes this one step further than other systems in this space to Dyamic MDA™. The high level of abstraction afforded by the action semantics, UML based modeling and CWM based transformations are combined in a dynamic unified model that is used from early development and requirements through to execution. Unlike other MDA tools that transform the initial model into lower level artifacts (java code in most cases), Cogility Studio retains the original model semantics all the way to execution. Because the model is directly executed and used throughout the lifecycle of the project the benefits of the model-based approach are multiplied. Direct execution of the model also prevents loss of intent, which is a common problem with many code generation based approaches where the model and the code do not quite agree on what the logic means. In some approaches there are several stages of transformation (BPMN, to BPEL, to execution) where each transformation involves changes to the logic. These approaches often result from acquisitions. Cogility Studio was built from the ground up to meet and solve these challenges. The integrated approach yields more power and efficiency than is present in competing products.

In addition to a consistent level of abstraction, Cogility Studio includes integrated configuration management allowing project management, stakeholders, developers, and operational personnel to ensure the version of all application objects being used in execution. This greatly reduces debugging and problem resolution times, reduces communications issues within development teams, and increases confidence in the executing system.

This integrated model-based approach further allows very agile and adaptable development styles. Changes can be released to production in minutes because only logic changes are deployed rather than whole systems. The ability to share a database with multiple versions of the same application further supports operations by allowing staged deployments to a cluster; this reduces downtime and increases productivity as deployments do not need to be grouped together to accommodate scheduled maintenance windows. This rapid deployment drives better ROI in that investments are smaller to introduce new features, and value can be realized sooner on that investment. In addition, the ability to rapidly deploy changes has the effect of reducing the fear and risk of incomplete solutions and allows a more streamlined near term focus in the development process. This reduces over-engineering and further shortens development times.

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1. All Cogility appliances ship with Oracle Database Enterprise Edition, Oracle WebLogic Enterprise Edition, Oracle Real Application Clusters, and Oracle JRockit JVM