

# Elsinore Technologies

## IssueNet Technical Datasheet

### Overview

The IssueNet platform provides an extensible framework to handle all issue management needs inside an organization. As every department faces issues in a variety of shapes and forms, IssueNet adapts by presenting different data schemas, workflows, and UI elements. This ability to customize combined with the latest most versatile technology allows IssueNet to seamlessly integrate into any organization.

### Technology

IssueNet is constructed on the Microsoft .NET platform. All IssueNet modules are written in C# using the latest presentation technologies available. The following major .NET Technologies are used in our product modules:

- ASP.NET Web Forms (System.Web.UI namespace)
- ASP.NET Web Services (System.Web.Services namespace)
- Winforms (System.Windows.Forms namespace)
- ClickOnce Deployment (System.Deployment namespace)
- MSBuild (Microsoft.Build namespace)
- Windows Presentation Foundation (future) (System.Windows namespace)

All modules offer integration with custom .NET plugins. This allows you to write components in your .NET language of choice with further ability (provided by .NET) to interact with legacy code.

### Architecture

The IssueNet system is organized in three tiers for maximum flexibility. The following diagram illustrates the arrangement of the system components:

**Tier 1:** The applications in the Client tier represent existing modules in the IssueNet system, but can also include custom standalone applications or existing applications in your infrastructure.

**Tier 2:** The Service tier is comprised solely of the IssueNet Web Services. The HTTP/SOAP protocols allow applications to be used from anywhere with an internet connection. These services act as an intermediary between client applications and the database providing several benefits:

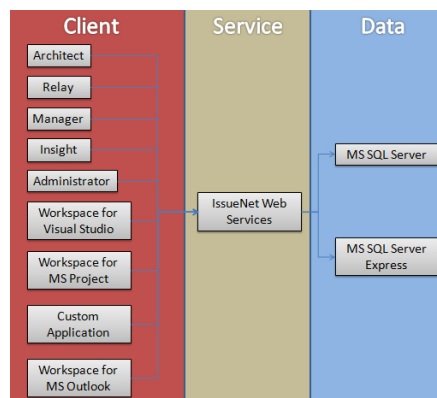
**Security:** Allows the database server to be tucked well within your firewall while exposing application functionality from remote internet locations.

**Performance:** Work is performed closer to the database server increasing efficiency.

**Load Distribution:** Deployment can span several servers contributing to scalability.

**Interoperability:** Disparate systems can communicate through standard HTTP/SOAP protocols.

**Tier 3:** The Data tier provides two options based on Microsoft SQL Server technology. The full SQL Server product allows for virtually unlimited scalability of data volume, concurrency, and performance. The free SQL Server Express product is a hassle-free alternative for small to medium sized installations.



### Server Requirements

#### Supported Server Platforms

- Windows 2000, XP, Vista, 7
- Windows Server 2003, 2008
- IIS 5.0 or greater is required to run host web services and applications

#### Supported Databases

- Microsoft SQL Server 2000, 2005, 2008
- SQL Express 2005, 2008
- MSDE 7, 2000

#### Min. Server Specifications

- Windows 2000 OS
- 800Mhz Pentium 3 processor
- 512 MB RAM
- 100MB disk space
- SQL Express 2005, 2008
- MSDE 7, 2000
- .NET Framework 3.5

#### Recommended Specifications

- Windows Server 2003
- 1.5Ghz Pentium 4 processor
- 1 GB RAM
- 1 GB disk space
- SQL Server 2005, 2008
- .NET Framework 3.5

### Client Requirements

#### Supported Platforms

- Windows 2000, XP, Vista, 7
- Windows Server 2003, 2008

#### Min. Server Specifications

- Windows 2000 OS
- 800Mhz Pentium 3 processor
- 512 MB RAM
- 100MB disk space
- SQL Express
- .NET Framework 3.5

## Extensions and Customization

The technology and architecture of the IssueNet platform contribute to the high degree of extension and customization potential. This is accomplished through a variety of different methods ranging from very easy WYSIWYG design to advanced .NET coding.

- Custom data schemas are created through the IssueNet Architect tool. Object-oriented classes can be defined to handle special types of issues without cluttering other issues types with unnecessary fields.
- Forms can be designed with a WYSIWYG editor in the IssueNet Architect. Many forms can be defined each for a specific issue type and situation. Fields can be easily dropped onto forms and bound to specific data fields.
- Workflows specific to your organization are designed in the IssueNet Administrator. Workflows will route tasks to the appropriate personnel and execute actions in between. Actions include sending notifications, creating issues, modifying issues, and running scripts.
- Scripts can be executed as part of workflows and in response to form events. Scripts are written in VB.NET and can be used to implement logic or to call into plugins containing the logic.
- Plugins represent compiled .NET DLLs and can hook into a variety of areas. Plugins are generally used when extensive customization is necessary. Compiled forms, custom UI controls, and custom item lists are just several of the many elements available to plugins.
- MSBuild tasks are available for integration into build systems. Tasks are available to execute queries, create objects, and update objects. Our basic tasks provide an infrastructure to be easily extended if needed.
- Custom applications can leverage our powerful SDK to interact with an IssueNet system. Virtually all functionality available to our own IssueNet modules is available in the SDK.

## Scalability & Performance

Technology and architecture again contribute greatly in the areas of scalability and performance. The distribution of processing over three tiers allows for very flexible and fault tolerant deployments.

The Web Services middle tier benefits from scaling both horizontally and vertically. Typically we recommend scaling vertically as much as possible until the price-to-performance ratio of the machine becomes unreasonable, and afterwards scaling out horizontally. Horizontal scaling is typically achieved with either software or hardware load balancing, both requiring client affinity. High availability scenarios could dictate horizontally scaling sooner. These strategies lead to theoretically unlimited scalability. In practice we have not discovered a limit.

The database server tier scales with the technologies available in Microsoft SQL Server. As with the web services tier, we recommend to first scale vertically, then horizontally. Our preferred method of horizontal scaling is Database Mirroring. IssueNet is also friendly with Merge Replication through the use of GUIDs for primary keys rather than incrementing sequence numbers. These strategies will also lead to theoretically unlimited scalability. We have not discovered a limit with the data tier scalability.

IssueNet also benefits from many optimizations designed for performance and scalability. These include:

- Objects are cached on client. Issues, folders, tasks, and all objects within the system are maintained in a cache.
- Data is paged from the server. When executing a query, the client only requests the IDs of the resulting objects. The client next consults the cache for the objects on the current page. Only objects on the current page absent from the cache are fetched from the database.
- Indexes are defined in the class editor for commonly filtered fields.

## IssueNet Online

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