



WHITE PAPER  
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# Crystal Decisions and Microsoft .NET

Our Strategy for Delivering Enterprise Reporting, Analysis, and Information Delivery Infrastructure for the Microsoft .NET Platform.

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## KEY POINTS

- Crystal Decisions™ software is all about enabling organizations to better understand the data they collect about customers, employees, and partners.
- Crystal Decisions software has been integrated and optimized for the Microsoft® .NET platform.
- Microsoft .NET is a software platform for connecting information, people, systems and devices.
- Microsoft® Visual Studio® .NET has an integrated special edition of Crystal Reports® called “Crystal Reports® for Visual Studio® .NET.”
  - This edition is based on Crystal Reports 8.5 but has the Crystal Reports 9 file format since it fully supports Unicode.
  - This tight integration is just the first step in our expansive support for Microsoft .NET
- Visual Studio .NET is the comprehensive tool which Microsoft has developed to allow developers to build the next generation of applications in a highly visual manner.
- Crystal Enterprise™ customers can leverage securely managed reports directly into new .NET applications directly from within the Visual Studio .NET “Server Explorer”, leveraging Crystal Decisions advanced server technology.

## OVERVIEW

Crystal Decisions has been providing our enterprise customers with solutions that connect their people and information for nearly 20 years. In fact, nearly 90% of the Global Fortune 500 use Crystal Decisions technology every day to increase productivity, reduce risks, drive revenue and better understand their customers and partners.

Crystal Decisions has combined the innovations of the .NET Framework, tools and technologies with our enterprise reporting, query and analytic capabilities to create a more compelling application framework. With that application framework, organizations will be more effective at developing and delivering enterprise information solutions that help their business run better.

Crystal Decisions' solutions are built on a highly scalable and open infrastructure based on industry standards. Through our strategic partnerships with many of the largest software companies in the world, Crystal Decisions helps customers maximize their existing technology investments, while adding value by providing end users with better information to improve decision-making and business performance. Nowhere is this more evident than our long-term, close relationship with Microsoft. This partnership has culminated in the past half decade to create a highly scalable and robust reporting and information delivery platform that is more tightly integrated with Visual Studio .NET and the .NET Framework, and more closely aligned with Microsoft's .NET vision, than any other business intelligence product on the market.

This white paper will help you understand Crystal Decisions' .NET strategy by examining our .NET partnership with Microsoft, our .NET solution, our .NET technologies, and the business benefits of our integrated solution.

## OUR .NET PARTNERSHIP WITH MICROSOFT

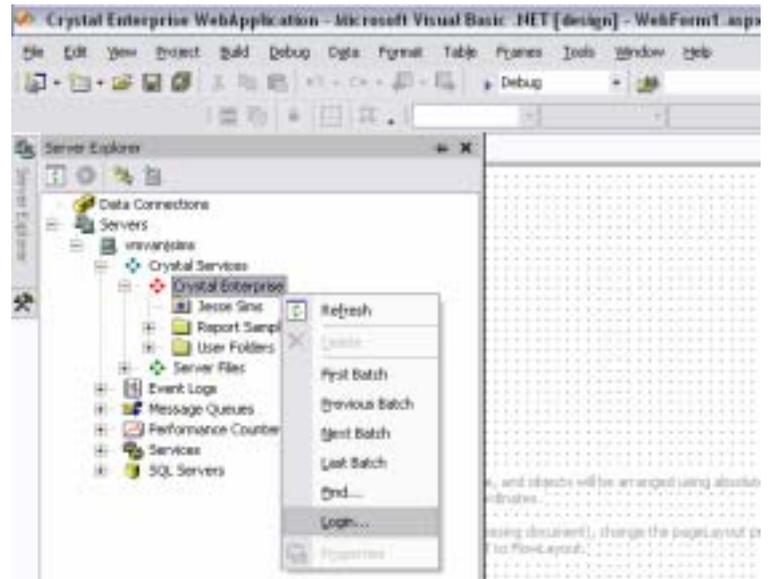
This is where Crystal Decisions' .NET strategy begins. The fact that we are the only third-party business intelligence technology that comes bundled within Visual Studio .NET is significant because it means that Crystal Decisions technology has been a part of the platforms development since 1999. The fact that Microsoft brought our technology into the Visual Studio .NET "Product Family" means enterprise organizations can take comfort in knowing that our solution has been through a thorough proof of concept and has met Microsoft's rigorous QA standards.

Crystal Decisions has also spent years working to ensure Crystal Enterprise, our highly scalable and robust reporting, analysis and information delivery platform, can be installed tightly with Visual Studio .NET and is optimized for running on Windows Server 2003. Crystal Enterprise customers can access



centrally managed, secure reports by opening the Server Explorer within Visual Studio .NET and signing into Crystal Enterprise. The image below shows a screenshot of Crystal Enterprise 9 being accessed from directly within the Visual Studio .NET Server Explorer. Note in particular that a user must log in to Crystal Enterprise in order to gain access to securely managed reports.

The compelling tools and technologies that Microsoft and Crystal Decisions are delivering for the Microsoft .NET platform provide a seamless, integrated developer experience and reduce the time, complexity, and risk behind creating feature-rich reporting for virtually any type of application. Put simply, Crystal Decisions' products align with Microsoft .NET technologies because we've spent year's working to ensure our technologies represent a dependable reporting standard. Crystal Decisions has made a decision to pursue a deep technology partnership with Microsoft in order to deliver the highest level of productivity gains to enterprise developers using Visual Studio .NET.



## OUR .NET STRATEGY

### Explaining Crystal Decisions .NET Strategy

Think of our .NET strategy as an extension of our track record: we are combining the innovation of the .NET Framework, tools and technologies with our enterprise reporting, query and analytic capabilities to create a more compelling application development framework that will help make you more effective at developing and delivering enterprise information solutions.

To understand Crystal Decisions' .NET strategy think of the combination of tools and technologies from Crystal Decisions and Microsoft being provided through a spectrum of components and servers including Visual Studio .NET, Crystal Reports 9 Advanced Edition, and Crystal Enterprise 9. Our technology offerings in the .NET context comprise a unified family of products that deliver a continuum of capabilities that follow a clear technology path that's aligned with a company's growing commitment to Microsoft's .NET vision. In other words, our products deliver a *completely integrated reporting solution* for the .NET enterprise.

With each of the above mentioned products integrating seamlessly with the .NET Framework, developers are able to fulfill a range of reporting options depending on their application requirements. Our .NET strategy is to make available Crystal Decisions reporting tools and technologies that will scale to the needs of any .NET developer, from providing a single XML Report Web Service for a small departmental application .NET, to creating a global, enterprise information delivery infrastructure serving thousands of end users.

## What .NET Means to a Crystal Decisions Customer

We believe that organizations will be able to build applications with .NET technologies that will create opportunities whereby Crystal Decisions technology can provide an even greater business value for our customers. It comes back to the basic premise that .NET improves the way information is communicated over the Internet. Crystal Decisions simply takes that one step further and refines content presentation and delivery mechanisms for organizations so they can build better business intelligence solutions.

If your organization is interested in reducing the cost of communicating between a proliferation of Web sites and disparate systems, which is a major pain point for most IT departments, or you are interested in communicating with partners and customers more effectively over the Web in order to maintain a competitive edge, Crystal Decisions and Microsoft .NET offers a cost-effective way to pull information together across multiple business partners, across disparate business systems using standard protocols that are accepted around the world.

So how does Crystal Decisions improve on the value of .NET? Let's use an example to help demonstrate our value. Let's assume your organization wants to really understand the data it collects every day on customers, partners and employees. It wants to identify trends early, minimize risks, maximize opportunities, and ultimately make the most informed decisions possible. Let's assume your management team wants to share information between your inventory system, your ordering system and the shipping company that transports your product. One route would be to use Web services to hook those systems together. XML Web services are simply re-usable pieces of software that allow applications to share information via the Internet, regardless of the operating system or back-end software involved. Think of them as delivery trucks that are available at your beck and call to load with correctly addressed data packets, literally millions of combinations of 0's and 1's. They could be busy all day passing packets between database applications that nobody really cares about, or wants to see. But if select groups of people in your company need to look at specific information—for example to see shipping orders, or to check inventory levels, or to schedule a delivery, or to evaluate business performance by looking at shipping orders over time—then imagine how much more valuable that data delivery would be if the truck arrived, on demand, full of formatted, graphical information, and interactive reports so that each user could work to the best of their ability? That's Crystal Decisions' contribution to the .NET platform. From the users' perspective, Crystal Decisions technology works invisibly, right inside the truck, changing data into information for business decision-makers. That's a direct result of the level of integration our products have with .NET: developers can leverage Crystal Reports and Crystal Enterprise from right *inside* Visual Studio .NET, without having to worry about switching from one set of tools to another. All this equals layer upon layer of productivity gains and an unmatched level of integration. Combine this with our award winning technical support division that's been working with Visual Studio .NET for year's, and who can answer virtually any product-related questions, and Crystal Decisions has a winning combination of tools, technologies, and after sales support.

In summary, Visual Studio .NET provides a new and better way to build the underlying infrastructure to create business applications: i.e. improve communications between business systems, partner systems, or even customer's systems. Crystal Decisions software can actually enhance the value of the .NET infrastructure by improving the value of the information it delivers to end users, and giving a customer

more control over how information is delivered to them, in what format it is delivered, and when that information should be delivered.

### Information Powers Business: Where Crystal Decisions Comes In

The whole premise behind Crystal Decisions technology is to enhance the value of business information so that data can be used to answer questions and support decision-making. Companies are buying into this premise in a big way, with corporations regularly investing millions in ERP, CRM, and supply chain management systems to capture data they can use about customers, competitors, partners, market conditions or business processes.

Just as statistics on the information explosion have proliferated until they are almost meaningless—more information has been produced in the last 30 years than the previous 5,000; science and technology information is increasing 13 percent each year; Web content doubles every 90 days; one gigabyte of data is equal to a pick-up truck filled with paper—so companies are struggling to make all this data relevant. Microsoft's .NET software makes Internet-based computing and communications even easier, thereby accentuating the challenge of dealing with an information explosion and throwing into relief the business value behind Crystal Decisions' technology.

It comes back to this basic premise: .NET improves the way information is communicated over the Internet: Crystal Decisions simply takes that one step further and refines content presentation and delivery mechanisms for organizations so they can build better business intelligence solutions.

To learn more about Microsoft .NET, please see Appendix A: Understanding Microsoft .NET, or visit [www.microsoft.com](http://www.microsoft.com).

### OUR .NET SOLUTION – A THREE PART OFFERING

The combination of tools and technology from Crystal Decisions and Microsoft is provided through a spectrum of components and servers including Visual Studio .NET, Crystal Reports, and Crystal Enterprise.

For a large number of our customers, their first experience with our solution is through Visual Studio .NET, which includes a custom edition of Crystal Reports called Crystal Reports for Visual Studio .NET. Crystal Reports for Visual Studio .NET is included by default installation in all major editions of Visual Studio .NET – including Enterprise Architect Edition, Enterprise Developer Edition, Professional Developer Edition, and





Student Edition. This custom edition is localized into all 9 languages in which Visual Studio .NET is available. This bundled edition includes integrated reporting components consisting of a designer and Web Form and Windows Form viewers.

The collection of components bundled with Visual Studio .NET can be extended even further by purchasing and installing Crystal Reports 9 Advanced Edition which provides additional capabilities including an enhanced designer, mobile application support, extended data source connectivity, additional report viewing, exporting and printing options, as well as over 50 additional features and enhancements.

Our reporting components are integrated everyday into a wide variety of applications. Developers leading the charge building the next generation of enterprise applications often require features such as content management, offloaded processing, scheduled data access, and connectivity to core business systems including SAP, PeopleSoft, and Siebel. These development challenges are more easily overcome by calling on our server software, Crystal Enterprise.

Regardless of which technology best meets your organizations needs, Crystal Decisions .NET solution helps accomplish three key things. First, it helps organizations access the vast amounts of data they are collecting and help them see that data in a way that makes sense so that they can make better business decisions. Second, it provides an unmatched level of integration, offering layer upon layer of productivity gains for enterprise developers building next generation Windows, Web, XML Web Services, and Mobile applications. Third, it provides a highly secure and robust enterprise reporting platform that has been built to be highly scalable and reliable when running on Windows Server 2003.

Crystal Decisions offers three core reporting technologies for the enterprise application developer working within the .NET Framework:

- The Visual Studio .NET bundled edition of Crystal Reports
- An upgrade to the bundled edition called Crystal Reports 9 Advanced
- Crystal Enterprise 9

This section will take a closer look at how each of these technologies provides value for developers.

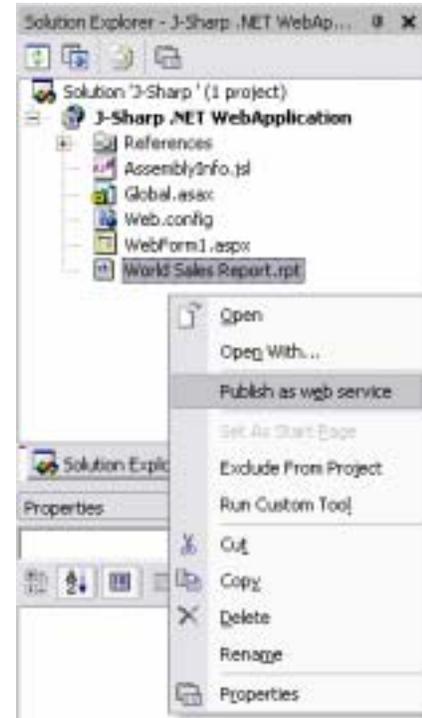
### **Part One – Crystal Reports for Visual Studio .NET**

Crystal Reports for Visual Studio .NET is a custom edition of Crystal Reports that is based on Crystal Reports version 8.5 Developer Edition but actually utilizes the version 9 file format since it fully supports Unicode. This bundled edition, which is part of the Visual Studio .NET “Product Family”, includes integrated reporting components consisting of a designer and Web Form and Win Form viewers. It provides a highly integrated therefore productive experience for creating great looking reports that are based off virtually any Microsoft data source. These Crystal Reports can then be integrated into any Web or Windows application. As shown in the screenshot below, built-in functionality allows virtually any Crystal Reports .rpt file to be automatically published and shared as an XML Report Web Service with just one mouse click.

Crystal Reports for Visual Studio .NET provides developers with a fast and productive experience for creating presentation quality, interactive reports that can be tightly integrated into virtually any type of application.

This edition of Crystal Reports is the reporting standard for .NET Windows, Web and XML Web services applications. It allows developers to rapidly build reporting functionality into a .NET application using the Integrated Report Designer so that customers enjoy a Rapid Application Development (RAD) experience in any programming language within the Visual Studio .NET Integrated Development Environment (IDE).

The Integrated Report Designer allows developers to work with programmable objects within the .NET Framework, so there's no need to switch from one toolset to another, reducing the time it takes to embed report content into a .NET application. It is important to note here that Crystal Reports for Visual Studio .NET takes advantage of standard, fundamental elements of the .NET Framework, like XML Web services and the ADO.NET support, further increasing a developer's productivity working within this new application development environment. ADO.NET Dataset Support allows developers to consume runtime data.



Crystal Reports for Visual Studio .NET 2003 de-couples report design and modification from core application development and coding, allowing developers to introduce new reports without risk of impacting their core application code. The design environment streamlines the development of new reports.

Crystal Reports often represent a key repository for business logic in many data-centric core business applications. Existing Crystal Reports can be quickly exposed as web services or integrated into new .NET applications to rapid deployment.

## Part Two – Crystal Reports 9 Advanced Edition

Crystal Reports 9 Advanced Edition is the feature-rich upgrade to Crystal Reports for Visual Studio .NET. It provides an enhanced designer with advanced report design features such as report preview mode and advanced charting technology, support for the integration of Crystal Reports into mobile applications, extended data source connectivity so you can connect to additional data sources, and advanced report exporting and printing features for Crystal Reports displayed on Web pages. Overall, this upgrade from Crystal Reports for Visual Studio .NET provides more than 50 new features and upgrades.

Crystal Reports for Visual Studio .NET only allows a user to access data built in the .NET environment—the ADO.NET Record Set or an ODBC connection to a SQL database— however, Crystal Reports 9 Advanced Edition allows a developer to access many more data sources making it more scalable in a heterogeneous

IT environment. It offers everything that comes bundled with Visual Studio .NET but provides a report designer with many more capabilities around report functionality and design.

Crystal Reports 9 Advanced Edition includes more flexible licensing for deploying Web applications by offering report caching and queuing technology to manage variable user loads and speed the deliver of frequently requested content.

### **Part Three – Crystal Enterprise 9**

Crystal Enterprise 9 is our server-based enterprise reporting, analysis and information delivery platform. It is the reporting solution for enterprise applications that require the most highly available, scalable and secure reporting technology available. It is built to support enterprise applications that require features such as content management, offloaded processing, scheduled data access, and connectivity to core business systems including SAP, PeopleSoft, and Siebel.

Crystal Enterprise is our high-end technology that sits at the pinnacle of our .NET solution. When purchased and installed on a developers system, it offers an advanced enterprise reporting object model (EROM) made available through a .NET Software Developer Kit (SDK). Crystal Enterprise can be accessed from the Server Explorer within Visual Studio .NET, integrated into a custom front-end using the .NET SDK, and extended by programming against the EROM by using the .NET SDK. For example, Crystal Enterprise can be used to serve enterprise reporting and analysis to multiple business units that have customized front-ends. Our back-end server technology offers each the ability to leverage an extensive toolbox of features and functionality.

By using the Crystal Enterprise .NET SDK, enterprise developers can write programs in Visual Studio .NET using pre-built programmable objects so they can quickly access all the rich services and functionality of Crystal Enterprise—scheduling, security, formatting, delivery, etc.—and add the value of a sophisticated, enterprise-wide reporting solution to their .NET development projects. In other words, a Crystal Decisions .NET solution brings all of these complex content presentation and delivery capabilities to the table at reduced development costs.

The Crystal Enterprise services can be controlled through a web based administrative console that also provides security integration services. A number of client applications are included with Crystal Enterprise that provide a feature rich environment for end users to view, schedule, modify and create web based reports and queries.

Running on Windows Server 2003, Crystal Enterprise provides the enterprise scalability and reliability large organizations demand and expect. With extensive programmability directly from within Visual Studio .NET 2003, it is the report platform of choice for those organizations requiring best-of-breed technology.

In the end, Crystal Enterprise increases development productivity and the value of any enterprise reporting infrastructure your organization needs. It helps lower the total cost of ownership for business intelligence by providing a platform that can be used to deliver a broad range of end user functionality through multiple applications that consolidate information from disparate databases.

## OUR .NET SOLUTION – THE BUSINESS BENEFITS

Customers building a business intelligence solution using a Crystal Decisions' .NET tools and technologies can expect to benefit from the following core benefits of our .NET solution:

**1) Crystal Decisions has been developing products that integrate with Visual Studio and Visual Studio .NET technologies far longer than any other business intelligence vendor.**

Our products offer the most maturity in relation to integration and functionality with Visual Studio .NET. There are vendors out there still asking their customers what they'd like to see in their .NET SDK, and we're already shipping our 2<sup>nd</sup> generation .NET SDK. We've been working in this environment in conjunction with Microsoft for years, which from an organizational standpoint shows that we are forward thinking and savvy enough to make a commitment to .NET for *all* our products, not just Crystal Reports. We know that BI is a critical component to any business, so we made sure we were first out of the gate with reporting technology that integrates with .NET technologies and that can scale to meet the business intelligence needs of our largest enterprise customers. Our experience in the .NET environment will help you build business intelligence solutions with staying power.

**2) The Crystal Decisions' .NET Solution provides a virtually future-proof technology growth path.**

The capabilities provided in our technology are available and extendable via Visual Studio .NET. Because our products deliver a completely integrated reporting solution for the .NET enterprise, they come with the assurance that we have minimized the risk of running into technology dead ends. You can move ahead with your .NET applications confident that along the way there will be a Crystal Decisions reporting solution to fit your needs.

**3) The Crystal Decisions' .NET Solution provides a dramatic reduction in development time and cost.**

As an integral part of Visual Studio .NET, our technology shortens the time to benefit from new .NET applications. The value here is more than economic: building software applications quickly to address needs as they arise improves a business' responsiveness and agility. As members of a complete integrated reporting solution, both Crystal Reports and Crystal Enterprise deliver this value: through the Crystal Reports integrated report designer and through the Crystal Enterprise .NET SDK that makes available programmable objects for use within Visual Studio .NET.

Another way of looking at this benefit is that it frees up developers to work on addressing business logic in creating applications that focus on solving business problems. Our value proposition in that is that we take a lot of repetitive, basic work out of developing data visualization and presentation functionality, and we provide that out of the box so you can concentrate on the rest of your application.

**4) The Crystal Decisions' .NET Solution reduces start-up costs.**

Deploying a Crystal Decisions' .NET solution means you won't have to rip out and replace legacy systems and start fresh, or create new reports when you build .NET applications with reporting functionality. You can still build reports off all your data sources and even leverage existing Crystal Reports assets. In fact, customers can take advantage of the existing Crystal Decisions reports, tools and technologies, except that they are extensible with Visual Studio .NET.

**5) The Crystal Decisions' .NET Solution standardizes content presentation and delivers consistency across all of your .NET enterprise applications at the user interface level.**

This means that Crystal Decisions adds value through providing a consistent, known way of viewing and interacting with information across virtually every single .NET application that you are building now, or will build in the future. It also means that companies will enjoy reduced training costs and less downtime associated with incorporating new technologies into the workplace.

**6) The Crystal Decisions' .NET Solution reduces the risk and complexity of building .NET enterprise solutions.**

Our solutions do so by providing pre-built reporting functionality in programmable objects for developers to work with inside Visual Studio .NET. By bringing in software packages that address complex reporting and data access needs, Crystal Decisions actually increases the efficiency of development efforts, so an organization does not need to hire new employees and train them to use complicated development tools. Working with industry standards by using Visual Studio .NET and taking advantage of a huge pool of developer talent, resources and support (for both Visual Studio and Crystal Reports) dramatically reduces the risk of new projects.

**7) The Crystal Decisions' .NET Solution provides enterprise scalability.**

A Crystal Decisions .NET solution provides the enterprise scalability demanded by large corporations with complex business intelligence requirements. With direct access from within Visual Studio .NET, you can leverage Crystal Decisions to access disparate databases and deliver information from multiple applications to the right users, at the right time, in the right format, instead of needing to code these capabilities yourself. Aligning with the Microsoft .NET vision, a Crystal Decisions .NET solution can bridge technology gaps by giving developers all the productivity tools required to quickly build an enterprise-caliber information delivery infrastructure that encompasses heterogeneous IT environments with ease.

**8) The Crystal Decisions' .NET Solution lowers the cost of a business intelligence solution.**

Organizations can take advantage of a Crystal Decision .NET solution, providing a single, scalable enterprise-wide reporting infrastructure that's programmable from directly within Visual Studio .NET to help lower the total cost of business intelligence. For example, Crystal Enterprise helps lower the total cost of ownership for business intelligence by providing a single standardized platform with powerful server-side deployment and management on Windows Server 2003.

**9) Crystal Decisions provides a robust, secure .NET reporting solution.**

A Crystal Decisions .NET solution is built upon a distributed component architecture that complements the distributed yet connected computing model of Microsoft .NET. Crystal Enterprise's sophisticated load-balancing, complete fault tolerance and support for automated fail-over come right out of the box. Crystal Enterprise 9 and Windows Server 2003 are a powerful combination, offering the level of dependability demanded by the largest organizations running global operations 24/7.

Crystal Decisions also provides an integrated security system out of the box that integrates seamlessly with Microsoft Windows Server 2003 Active Directory. This means your organization

can leverage existing Active Directory security protocols and not have to design, build, test, deploy and QA security systems from scratch.

**10) The Crystal Decisions' .NET Solution leverages existing information assets.**

Are you upgrading older ASP applications to leverage the advances of ASP.NET? Do you want to integrate existing Crystal Reports into your new .NET applications? A Crystal Decisions solution can leverage any existing Crystal Reports files and report creation knowledge for use within virtually any type of .NET application. This helps reduce the start up costs and complexity of moving forward with your .NET development projects. Using Crystal Enterprise, you won't have to re-write existing Crystal Reports, meaning you can easily and rapidly leverage existing information assets for immediate use in Web applications today.

**CONCLUSION**

In this white paper you have learned that Crystal Decisions delivers a range of compelling and innovative .NET tools and technologies that leverage and extend your organizational information assets into the Microsoft .NET platform. From our integrated edition of Crystal Reports that is built right into Visual Studio .NET, to our feature-rich upgrade Crystal Reports 9 Advanced, and extending to our enterprise scalable and reliable Crystal Enterprise 9 reporting and analysis platform, our .NET solutions can help your organization better understand the customer, partner and employee data your business collects. We help businesses make better business decisions – leading to improved productivity, reduced risks, and increased revenue. In short, Crystal Decisions has the products to help make your .NET reporting and business intelligence development efforts a success.



## ABOUT CRYSTAL DECISIONS

Crystal Decisions is an information infrastructure company is a market leader in reporting, analysis and information delivery. Our solutions help customers make better business decisions by bringing together their people and their information. We provide a standardized, web-based information infrastructure to help customers access their disparate data sources such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM), and distribute secure interactive reports and analysis to every end user, customer and partner. We are a leading information infrastructure company with best of breed reporting and analysis solutions and have shipped 14 million licenses of our award winning software.

Crystal Decisions' celebrated reputation for superior quality and outstanding value is evident in our complete range of reporting, analysis and information delivery solutions which include: Crystal Enterprise, Crystal Reports, Crystal Analysis and Crystal Applications. These solutions are built on a highly scalable and open infrastructure allowing for optimum distribution of information. They integrate ad hoc query, enterprise reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining capabilities for both Windows and Web clients. With our leading information infrastructure, and our strong strategic relationships, Crystal Decisions is uniquely qualified to deliver these leading applications to organizations worldwide.

Crystal Decisions can be found around the world at [www.crystaldecisions.com](http://www.crystaldecisions.com).

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## ABOUT CRYSTAL DECISIONS TECHNOLOGIES

[Crystal Enterprise™](#) is a next-generation integrated solution for reporting, analysis and delivery of information. Crystal Enterprise is based on scalable web-based infrastructure to help companies manage the access and delivery of strategic business information through customizable web applications for improved decision-making and business performance.

[Crystal Reports®](#) is a world standard for high-performance reporting. Enhanced web reporting, rich report design features, and superior developer tools enable users to easily deliver interactive content from virtually any data source, publish it to the Web or integrate it within applications.

[Crystal Analysis®](#) is a powerful new technology that enables flexible reporting against OLAP data sources, including the easy creation of analytic reporting applications. Next-generation zero-client technology based on XML and DHTML enables fast, cost-effective, and manageable deployment of highly interactive and easily navigable information to end-users.

[Crystal Applications™](#) Built on the strength of Crystal Decisions' award-winning reporting, analysis and information delivery solutions, Crystal Applications offer powerful, proven analytic application server and packaged business applications.

[Crystal Reports for Visual Studio .NET](#) provides developers with a fast and productive experience for building and integrating presentation quality, interactive reports with XML Web services and .NET applications. Crystal Reports dramatically increases developer productivity by leveraging existing Crystal Report assets and report creation knowledge, and enabling new business opportunities.

## APPENDIX A – UNDERSTANDING MICROSOFT .NET

### Defining the Basic Elements of .NET<sup>1</sup>

In order to articulate Crystal Decision’s .NET strategy a basic understanding of .NET fundamentals is required, especially as these relate to building business intelligence solutions. There are probably about as many definitions of .NET as there are people that have heard of it. Unfortunately, this paper won’t change that, except by offering at the outset Microsoft’s current official definition of .NET:

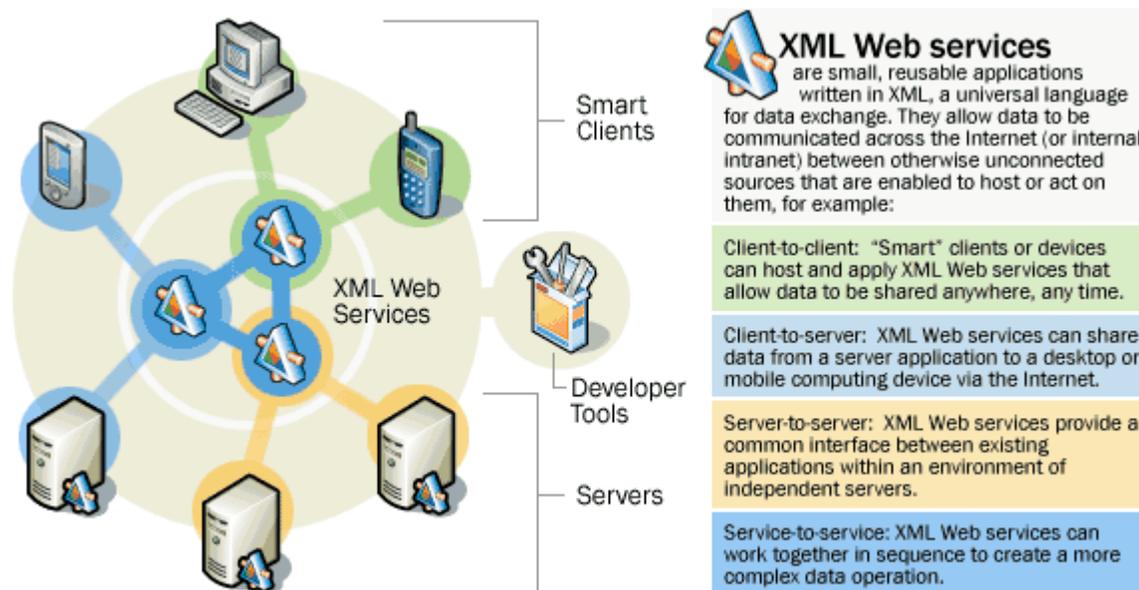
Microsoft .NET is software for connecting information, people, systems and devices. .NET provides XML-based interoperability and is being incorporated across Microsoft’s clients, servers, services and tools. For example, products like Windows and Office will use .NET to connect with other systems and applications. For developers, .NET is manifested in the .NET Framework.

The .NET Framework is defined as follows:

The .NET Framework is an integral Windows component that supports building and running the next generation of applications and XML Web Services.

The Microsoft .NET Framework is a platform or “underlying technology” for developers to build, deploy and run XML Web services and other .NET applications using the tools that are provided in Visual Studio .NET.

Microsoft .NET enables a high level of software integration through the use of XML Web services—small, discrete, building-block applications that connect to each other as well as to other, larger applications over the Internet:



<sup>1</sup> Source: Microsoft.com, April 2003

For the purposes of this paper, both Visual Studio .NET and XML Web services have been singled out for a more in-depth discussion. Visual Studio .NET provides Crystal Decisions' entry into the world of .NET. Our technology's deep integration into the .NET Framework enables developers to publish a Crystal Decisions report as Web service in just one click, right from within the developer's environment. Web services are the cornerstone of .NET programming and provide the basis for Microsoft's vision of how companies will be doing business online in the future.

## **Visual Studio .NET**

Launched in February, 2002, Visual Studio .NET is Microsoft's comprehensive set of development tools for creating .NET applications and XML Web services. With Microsoft Visual Studio .NET and the Microsoft .NET Framework, developers can develop XML Web services quickly and integrate them easily with other applications. During the launch Bill Gates hailed the two products as key to the development experience that will drive the phenomenon of XML Web services.

"Visual Studio .NET and the .NET Framework are among the most important products ever released by Microsoft and underscore our long-term commitment to developer success," he said. "As the first fully integrated development environment for building XML Web services and next-generation Internet applications, Visual Studio .NET and the .NET Framework will enable the next big wave of developer opportunity, creating XML Web services that will soon become the basis for all major new software development."

Instead of the company's usual two-year development cycle, Microsoft invested four years on building Visual Studio .NET. More than 3.5 million copies of Visual Studio .NET and the .NET Framework had been distributed during beta testing. The launch culminated with events in 150 cities worldwide, with more than 125,000 developers celebrating the final release of a product that had enjoyed one of the broadest beta adoptions ever and has already won four major industry awards.

## **XML Web Services**

XML Web services are very small, reusable application components that can be shared seamlessly among Web sites as services. XML Web services combine the best aspects of component-based development and the Web, and are a cornerstone of the Microsoft .NET programming model. In fact, one way to think of .NET is that Microsoft designed it from the ground up to be an XML Web services development and delivery environment. XML Web services:

- Allow applications to share data.
- Are discrete units of code; each handles a limited set of tasks.
- Are based on XML, the universal language of Internet data exchange, and can be called across platforms and operating systems, regardless of programming language.

A few years ago, businesses purchased packaged software that was installed on servers and desktops and ran off a platform like Windows. Their ability to communicate with different applications running on other platforms like Linux or MacOS was limited, creating islands of functionality and data. Businesses that wanted to integrate their own systems or communicate with partners and customers had to spend a lot of time and money getting disparate applications, systems and devices to talk to each other.

Today, businesses are getting used to a new way of doing things as they move towards delivering and accessing applications via the Web. They are doing this by combining online components, or pieces of software functionality, called Web services. Microsoft and other companies are building these Web services using open industry standards like XML, SOAP, and WSDL, and storing them on the Web service directory UDDI so that any business, irregardless of its IT environment can use them, customizing them to fit their own business needs. In other words, developers can assemble their .NET applications from existing code in a Web service, and new code they write themselves, regardless of platform, programming language or object model.

Web services have caught on rapidly. George Colony, Forrester Research Inc.'s Founder and CEO defined Web Services this way: "Web services are not the Web and not services, but Internet middleware enabling you to link to customers, partners and operating groups." He called them "the next technology thunderstorm" at the March 2003 ICT World Forum in Hanover Germany.

Microsoft's take on Web services underscores this importance of this technology. Bill Gates describes Web services as "the key to productivity that will span the entire economy."

In today's world there are a lot of people interacting with applications. In the future, Web Services will allow applications to talk to applications. Imagine being able to use one schedule to book your work and personal meetings and have your calendar communicate with your dentists office to let them know that a meeting has come up and you are no longer able to make your dental appointment next week. The calendar could propose a new time to be agreed upon by you when you log in to your calendar the next time. The whole concept is about applications becoming more useful and functional.