The Interoperability Executive Customer Council: A Collaboration with Microsoft

January 2010
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Executive Summary

Microsoft established the Interoperability Executive Customer (IEC) Council in June 2006 as a means of regularly interacting with customers to obtain valuable feedback regarding their specific interoperability requirements. The company meets twice a year with the IEC Council to discuss interoperability issues, and then meets throughout the year with technical and business working groups comprising representatives from the member organizations to drill down on interoperability details.

Since the launch of the council less than four years ago, IEC Council members have identified approximately 50 key areas for improved interoperability across Microsoft products and those of the software industry at large. At least 70 percent of these issues have been resolved or are on track to be resolved. For those issues that are most complex and difficult, the IEC Council and Microsoft are continuing to work together and with other vendors and organizations to find solutions.

In addressing the interoperability issues articulated by the IEC Council, Microsoft has employed or encouraged the development of different types of solution – either by integrating features into Microsoft products, developing open source bridges between products, or using strategies and solutions such as documenting protocol documentation, participating in standards evolution, and collaborating or supporting development of third-party products. And because IEC Council members and Microsoft share the common industry view that software users will continue to see a mixed IT environment of open source and traditional commercial or proprietary software, Microsoft continues to support open source communities with plug-fests, code contributions and or community project funding. The company is actively involved in ensuring Windows® is the best platform for running and hosting open source applications.

These IEC Council efforts are directed by executive sponsor, Bob Muglia, president, Microsoft Server & Tools. All the information gathered from the IEC Council process has been categorized into six areas of focus called “work streams”. Work stream efforts are led by executives from numerous Microsoft divisions and product teams who interact and partner with council members’ technical architects and CIOs to identify and develop solutions within these specific areas. These are:

<table>
<thead>
<tr>
<th>Office Productivity and Collaboration Tools</th>
<th>Systems Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity Management</td>
<td>Developer Tools and Runtime</td>
</tr>
<tr>
<td>Business Process Modeling and Services Oriented Architecture</td>
<td>Public Interoperability Policy</td>
</tr>
</tbody>
</table>

This white paper details the activities and progress of each of the IEC Council’s interoperability work streams.
About the Interoperability Executive Customer Council

Interoperability of software solutions has become an increasingly important, not only for governments and companies with heterogeneous computing environments, but for the software industry as a whole. The ability to connect people, data, and diverse systems in a seamless way reduces operational costs and complexity, enables best-of-breed deployments, and optimizes return on existing investments. Microsoft is committed to enabling to interoperability to benefit our customers.

Microsoft also recognizes the importance of listening to, and learning from, its customers regarding their needs. The company established the Interoperability Executive Customer (IEC) Council in June 2006 as a means of regularly interacting with customers to obtain valuable feedback regarding their specific interoperability requirements.

What Is the IEC Council?
The IEC Council is a select group of senior executives—chief information officers (CIOs) or the equivalent—who represent the great diversity of Microsoft’s customers today. Members hail from around the world and include businesses from a variety of industries, academic organizations, and government agencies of all sizes.

The council meets twice a year to discuss interoperability with Microsoft. In addition, representatives within the member organizations form technical and business working groups that meet with Microsoft throughout the year to drill down discuss interoperability in more depth. Each member also agrees to name one or more senior software architects to participate in the working group discussions throughout the year.

Deep Support from Microsoft
Microsoft supports the IEC Council at the highest levels of the company. Bob Muglia, president of Microsoft’s Server and Tools business, serves as the executive sponsor of the council.

“Interoperability is a very important issue for Microsoft’s customers, and we want their feedback,” says Muglia. “The IEC Council is dedicated to championing interoperability to ensure that technology supports and fosters their evolving business needs.”

Craig Mundie, Microsoft chief research and strategy officer, and Brad Smith, senior vice president, general counsel, also serve as executive sponsors. In addition, technical and business leaders from product teams across the company participate in the council and its workgroup discussions. In addition, a dedicated team manages the day-to-day activities of the council and guides discussions among council members and product teams.
Playing an Integral Role
The IEC Council plays an instrumental role in helping Microsoft deliver software that meets customers’ interoperability needs. Main activities of the IEC Council include:

- Raising and accelerating awareness around interoperability scenarios, pain points, and solutions
- Providing insight on Microsoft’s interoperability strategies and programs -- including activity regarding the company’s products and engagement in standards-setting activities -- can serve the technical community more effectively
- Influencing Microsoft’s interoperability design strategies and helping to prioritize critical interoperability scenarios and solutions through council discussion and feedback
- Sharing knowledge and best practices via a forum of members, which results in the formation of a strong solution base for problem solving

IEC Council members are also engaged at the senior executive level with other large software providers, so they are in a unique position to encourage these vendors to work with Microsoft to find solutions for the most complex interoperability issues.

Moving Interoperability Forward
Since the launch of the council less than four years ago, IEC Council members have identified approximately 50 key areas for improved interoperability across Microsoft products and the software industry at large.

In addressing the interoperability issues articulated by the IEC Council, Microsoft has employed or encouraged the development of different types of solutions. Approximately one-third of the issues that have been resolved have been addressed by integrating **features into Microsoft products**. Another third have been addressed by developing **open source bridges** between products. And the remaining third have been addressed using strategies and solutions such as **protocol documentation**, **standards evolution**, and **third-party products**. And because IEC Council members and Microsoft share the common industry view that software users will continue to see a mixed IT environment of open source and commercial products. Microsoft is engaging with open source communities like Apache, Eclipse, PHP & Zend, OpenPegasus and many others by conducting plug-fests, contributing code, and providing funding to related open source projects.

The type, focus and complexity of issues articulated by the council varies significantly along with the types of solution needed to resolve them. For example, the council identified the need for interoperable solutions in the area of authentication, authorization, and access management for
resources across heterogeneous systems. In response, Microsoft added identity federation capabilities to Active Directory by incorporating support for Security Assertion Markup Language (SAML), an XML-based standard for exchanging authentication and authorization between security domains, to Active Directory Federated Services (AD FS). AD FS enables simplified, secure sharing of digital identities across security boundaries, and includes specifications such as WS-Federation and WS-Trust.

In another example, IEC Council members expressed the need to exchange documents with partners or governments that accept only certain file formats, such as Open Document Format (ODF), which contributed to Microsoft’s decision to add support for ODF 1.1 to Microsoft Office Service Pack 2 (SP2).

Members also identified the need to support the application modeling standard Unified Modeling Language (UML). In response, Microsoft re-joined the Object Management Group (OMG) in July 2008 and has been an active member of the UML 2.3 Revision Task Force. Microsoft is integrating support for UML in Visual Studio 2010 development tools and the upcoming Oslo repository ("Oslo" is the code name for a set of future Microsoft modeling technologies).

A final example, Microsoft learned that IEC Council members use content and document management servers collaboratively within their organizations, and they want to integrate search, UI, metadata, content, personalization, and taxonomy across multiple portals. This feedback encouraged Microsoft to work with other vendors like EMC and IBM to achieve interoperability between enterprise content management systems through Content Management Interoperability Services (CMIS), a jointly developed specification that leverages existing open standards.

To ensure that solutions developed in response to IEC Council issues work well with the industry – or when solution require broader industry collaboration, -solutions are tested or implemented by Microsoft and the Interoperability Vendor Alliance (IVA), which works in parallel with Microsoft and provides the company a partner focus for interoperability advancement. For those that are most complex and difficult, the IEC Council and Microsoft are continuing to work together and with other vendors and organizations to find solutions.
Areas of Focus: Interoperability Executive Customer Council Work Streams

All the information gathered from the IEC Council process has been categorized into six areas of focus, or work streams, which are described in the following table:

<table>
<thead>
<tr>
<th>Work Stream</th>
<th>Major Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Productivity and Collaboration Tools</td>
<td>Office file formats; Office programmability and automation; portal, document, and content management servers; back-end and line-of-business application integration; unified communication; etc.</td>
</tr>
<tr>
<td>Systems Management</td>
<td>IT operations management; deployment and patching of software; virtualization environments; etc. IT operations want to optimize the management of heterogeneous enterprise environments while providing top-notch service to users based on their service-level agreements.</td>
</tr>
<tr>
<td>Identity Management</td>
<td>Identity federation scenarios for providing partners and customers with encrypted access to internal resources; single sign-on (SSO) techniques; user-centric approaches to identity management through third-party providers and relying parties; and Active Directory–Lightweight Directory Access Protocol (LDAP) integration.</td>
</tr>
<tr>
<td>Developer Tools and Runtime</td>
<td>Use of different development tools in a distributed environment; robust and high-performance interoperability between .NET and Java/mainframe applications; interoperability with open source languages and tools; consistent implementations of standard cryptology algorithms; etc.</td>
</tr>
<tr>
<td>Business Process Modeling (BPM) and Services Oriented Architecture (SOA)</td>
<td>Facilitating design, development, and management of business processes to run across multiple platforms and systems using multiple, interoperable frameworks and tools for architecture and modeling.</td>
</tr>
<tr>
<td>Public Interoperability Policy</td>
<td>Guiding Microsoft in its approach to the Interoperability Principles and related initiatives, and informing Microsoft’s public policy positions for interoperability, intellectual property, privacy, and security.</td>
</tr>
</tbody>
</table>
Recently, as cloud computing emerged as an area of significant investment and interest in the industry, the IEC Council member discussions led to the creation a new work stream on Cloud Computing. Recent discussions have touched upon:

- **Development environment and ecosystem for cloud computing**: ability to use various languages, tools to design, develop, debug and deploy applications to the cloud infrastructure
- **Development of various standards related to cloud computing**: virtualization, data access, identity management, deployment packages, etc.
- **Service calls, data access and portability across various cloud offerings**: ability to seamlessly access services hosted on other clouds (private to public cloud and public cloud to another public cloud), data access and portability over established industry standards
- **Privacy, security, and service policies around cloud computing**

As this is a nascent area, discussions within the council will help raise the awareness of emerging standards and practices and help establish requirements from enterprise customers that must be met by the IT vendors and industry in general.

The remainder of this white paper focuses on the activities and progress of each of the IEC Council’s interoperability work streams.
Progress in IEC Council Interoperability Work Streams

Office Productivity and Collaboration Tools Work Stream
IEC Council members want peace of mind when it comes to Office interoperability—they want to know that Office plays well with other applications and platforms, and that their data, while currently in an Office file format, for example, can also be converted to another format and opened with another tool. They also want portal and unified communications servers to be able to interoperate with various systems inside and outside the boundaries of the enterprise, for the purposes of collaboration.

In short, customers want to know their investments will be protected and their information and data won’t be locked into a system that they cannot move out of if and when they decide to.

Major topics in the Office Productivity and Collaboration Tools work stream include:

- Office file formats
- Office programmability and automation
- Portal, document, and content management servers
- Back-end and line-of-business application integration
- Unified communications (UC)

Some of the issues and solutions that the IEC Council has addressed include:

<table>
<thead>
<tr>
<th>Category</th>
<th>Scenario/Issue</th>
<th>Solution</th>
<th>Solution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Format</td>
<td>Support for new file formats (from an Office point of view)</td>
<td>Native ODF support in 2007 Office SP2—ISO standardization; plug-fest testing tools for better interoperability</td>
<td>Product feature</td>
</tr>
<tr>
<td>File Format</td>
<td>Open XML and ODF interoperability</td>
<td>Open source translators; transparency of implementation decisions; Document Interop Initiative; publication of specs under Open Specification Promise (OSP)</td>
<td>Open source bridge</td>
</tr>
<tr>
<td>Portal Authentication</td>
<td>Pluggable and claims-based authentication</td>
<td>Pluggable and claims-based authentication support</td>
<td>Product feature; protocol documentation</td>
</tr>
<tr>
<td>Portals</td>
<td>Ability to share portal UI across portals</td>
<td>Web Services for Remote Portlets (WSRP) toolkit</td>
<td>Open source bridge</td>
</tr>
<tr>
<td>Portals</td>
<td>Data interoperability between portals</td>
<td>CMIS support; Business Data Catalog and line-of-business interfaces; Duet</td>
<td>Standard</td>
</tr>
<tr>
<td>Programmability</td>
<td>Open XML support in Java</td>
<td>Apache POI project</td>
<td></td>
</tr>
<tr>
<td>UC—Presence</td>
<td>XMPP support in Office Communication Server (OCS)</td>
<td>XMPP gateway added to OCS for Extensible Messaging and Presence Protocol support</td>
<td>Product feature</td>
</tr>
<tr>
<td>UC—Presence</td>
<td>Interoperability with IBM Sametime, Cisco Unified Communications Manager (UCM)</td>
<td>IBM Sametime native interoperability—joint effort with IBM; Cisco UCM—Cisco engineering effort, jointly tested, based on SIP</td>
<td>Product feature; standard</td>
</tr>
</tbody>
</table>

Details of some of these solutions follow.
Open XML Interoperability: ODF, Office Binary, and HTML
Microsoft and the IEC Council have been collaborating to find ways to increase interoperability between different document format implementations. Continued collaboration with global industry leaders has resulted in the development of three open source translator technologies that allow for interoperability between Open XML and ODF, and translation from Open XML to HTML and from Microsoft Office binary format to Open XML.

Support for Additional File Formats
Office and other tools need to work collaboratively in the heterogeneous work place. Microsoft is building features into Office that support these new scenarios. Released in 2009, the 2007 Microsoft Office SP2 provides support for ODF 1.1, Adobe Portable Document Format (PDF) 1.5, and PDF/A and XML Paper Specification within Word 2007, Excel® 2007, and PowerPoint® 2007.

Promoting Choice and Expanding Opportunities
Microsoft hosts technical discussions and labs in cities around the world through the Document Interoperability Initiative, a global program of technical vendor discussions, labs, and solution enablement programs that are designed to promote user choice among document formats for end users and expand opportunity for developers, partners, and competitors.

Additional Standards Support in SharePoint
Many companies are adopting SharePoint products and technologies for document management and workflow and have asked for increased interoperability with other portal solutions. Microsoft has launched a toolkit for Office SharePoint Server 2007 interoperability using Web Services for Remote Portlets (WSRP), an OASIS standard, to allow competing portal solutions such as IBM WebSphere and BEA WebLogic to use content stored in Microsoft SharePoint.

Enterprise Content Management System Interoperability
Some companies use content and document management servers collaboratively within their organizations. They want to integrate search, UI, metadata, content, personalization, and taxonomy across multiple portals. Microsoft, EMC, and IBM are working to achieve interoperability between enterprise content management systems through Content Management Interoperability Services (CMIS), a jointly developed specification that leverages existing open standards.

IEC Council members have contributed much by bringing Office interoperability issues to the table. Today Office interoperability is working well. However, there are always more improvements and more standards to consider, and Microsoft and the council continue to collaborate on these issues. The interoperability of content management systems is another topic that is of interest to council members, and much activity is taking place with the council in this area.
**Systems Management Work Stream**

One of the most significant challenges that large-scale global enterprises face today is managing their distributed network environments. These heterogeneous systems often include multiple data centers running myriad platforms—mainframes, Linux, UNIX, and Windows—with an even wider array of hardware and software solutions, including Web applications based on Linux, Windows, Apache, IIS, PHP, ASP.NET, and so on. IT operations staffs want to optimize the management of these enterprise environments while still providing top-notch service to users based on their service-level agreements.

Major topics in the Systems Management work stream include:

- IT operations management
- Deployment and patching of software
- Virtualization environments

Some of the issues and solutions that the IEC Council has worked on include the following:

<table>
<thead>
<tr>
<th>Category</th>
<th>Scenario/Issue</th>
<th>Solution</th>
<th>Solution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtualization</td>
<td>Integrated management of virtual machines from a single console</td>
<td>Systems Center Virtual Machine Manager 2008 released</td>
<td>Product feature</td>
</tr>
<tr>
<td>Cross-Platform</td>
<td>Manage across the heterogeneous environment to lower TCO</td>
<td>Systems Center Operations Manager 2007 R2 in public beta extends the monitoring and management capabilities to non-Microsoft platforms, including HP UX, Sun Solaris, Red Hat Linux, Novell Suse, and IBM AIX; Systems Center Operation Manager (SCOM) end-to-end management IVA lab</td>
<td>Product feature</td>
</tr>
<tr>
<td>Management</td>
<td>Monitoring products from various vendors to work together</td>
<td>Connectors for SCOM 2007 R2—Tivoli, HP, BMC, Universal connector; SCOM—HP IVA interop lab</td>
<td>Product feature; third party</td>
</tr>
<tr>
<td>Virtualization</td>
<td>Multiple platform guest OS hosting</td>
<td>Hyper-V; Microsoft—Novell virtualization labs</td>
<td>Product feature; third party</td>
</tr>
</tbody>
</table>

Details of these solutions follow.

**Integrated Management of Virtual Machines**

Microsoft is currently working with Xen Source to extend the management capabilities of System Center Virtual Machine Manager for Linux virtual machines running on Windows Server virtualization. This integration will allow customers to host multiple, heterogeneous operating system images on a single virtualization environment and manage their virtual environments from a single console. It also will provide built-in integration from Windows to VMware virtual environments.
Cross-Platform Management
Council members have expressed the need to automate software deployment, patching, and asset inventory across their environments so that they can lower their total cost of ownership. In response, Microsoft announced in April 2008 the availability of Microsoft System Center Operations Manager 2007 Cross Platform Extensions Beta for the management of multivendor virtualization, operating systems, and applications. These technology innovations are designed to expand virtualization capabilities and introduce the use of open source technologies and industry standards to broaden the ability to deliver automated management of heterogeneous IT environments.

Simplifying Operations Management
IEC Council members have also expressed the need for monitoring products from various vendors to work together to provide a reliable, integrated management experience in their data centers. So Microsoft developed the Multi-Platform System Management Lab in collaboration with IVA partners.

One of the lab initiatives involved an effort to demonstrate the interoperability of Microsoft Systems Center with HP OpenView and IBM Tivoli. It came about as a result of IEC Council member Detlef Janezic with the NATO CIS Services Agency (NCSA), who shared with Microsoft the need for these product lines to work better together. Based on this input, Microsoft engaged in an initiative to resolve the challenges, and presented a solution to NATO in March 2009. NCSA’s initial assessment on this particular solution and its implementation is that it shows great potential. The agency plans to implement and test the provided solution in its IT environment as soon as possible.

Microsoft also has joined the Open Pegasus Steering Committee and contributed code to the open source community under an Open Source Initiative (OSI)-approved license.

Managing Virtual Machines from Various Vendors
IEC Council members expressed a desire to host virtual machines from different operating systems and use multiples virtualization systems (such as Hyper-V, VMware, and so on) while managing them from a single console. Discussions around virtualization standards, the manageability of different infrastructures, including cloud-based virtual machines, and portability across systems are ongoing. Microsoft continues to work with IEC members, organizations like the Distributed Management Task Force (DTMF), and industry partners to determine the appropriate solutions and the best approach to standardization.

In summary, systems management is an area in which Microsoft has been able to efficiently and effectively address council members’ needs through product modifications, new releases, and collaborative work with other companies.
Identity Management Work Stream

Identity management impacts companies today in a number of ways. Within the organization, interoperability of identity management is an issue when employees have trouble gaining authorization to different applications and systems. And as companies migrate their applications from mainframe and client-server environments to the Web, authentication and authorization becomes even more complex.

Beyond the walls of the organization, the growth of business-to-business commerce, government services via the Internet and employee mobility have resulted in companies extending their internal systems to customers, partners, suppliers, citizens, and mobile employees. Current authorization solutions in these scenarios are burdensome and sometimes also compromise security policies already in place.

Major topics within the Identity Management work stream include:

- Identity federation scenarios for providing partners and customers with encrypted access to internal resources
- Single sign-on (SSO) techniques
- User-centric approaches to identity management through third-party providers and relying parties
- Active Directory and LDAP integration

Microsoft has made significant headway in addressing council members concerns in these areas.

Some of the issues and solutions that the IEC Council has worked on include the following:

<table>
<thead>
<tr>
<th>Category</th>
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</thead>
<tbody>
<tr>
<td>Claims-Based Auth and ID Federation</td>
<td>Identity management, federation, and SSO for heterogeneous environments</td>
<td>AD FS 2.0 (formerly known as “Geneva” server)</td>
<td>Product feature</td>
</tr>
<tr>
<td>Claims-Based Auth and ID Federation</td>
<td>User-centric identity solutions</td>
<td>Information cards standardized by OASIS; publication of Identity Selector Interoperability Profile under OSP</td>
<td>Standard; protocol documentation</td>
</tr>
<tr>
<td>Claims-Based Auth and ID Federation</td>
<td>Security assertions—SAML support</td>
<td>SAML Token 2.0 supported in AD FS; SAML protocol support AD FS 2.0</td>
<td>Product feature</td>
</tr>
<tr>
<td>User Provisioning and Access Control</td>
<td>Provisioning of user accounts across multiple systems from different vendors</td>
<td>Microsoft Identity Lifecycle Management and partner solutions; automation of user provisioning and federation; directory synchronization</td>
<td>Third party</td>
</tr>
</tbody>
</table>

Details of some of the solutions follow.
Cross-Product Federation and Identity Management
Microsoft has developed solutions to enable cross-product federation and management of identities across a diverse array of directories and heterogeneous systems. For instance, the company incorporated support for SAML in the new version of AD FS. SAML allows AD FS and other identity management systems to interoperate with non-Microsoft directories and identity management systems, thus simplifying the broad federated sharing of digital identities and policies across organizational boundaries.

Previous versions of Microsoft products supported only WS-Federation and WS-Trust (even though they accepted SAML tokens). Many non-Microsoft products support the SAML protocol, so integrating SAML support into Active Directory provides the interoperability necessary for these products to work together. AD FS recently passed its first SAML 2.0 interoperability test. Microsoft developers are working with several industry groups to coordinate this support, and they are keeping the IEC Council informed of their progress on this issue.

Information Cards That Use WS-* Protocols
Microsoft has also made an ongoing investment in interoperability in the identity space by developing information cards that use WS-* protocols, which help Web developers support the primary mechanism for representing user identities in the identity metasystem. With information cards that customers generate themselves or receive from central providers, such as governments and financial institutions, users can manage and control their digital identities securely. IEC Council members have expressed a desire to see broad industry support for these technologies and want to be able to use them through many programming languages and platforms.

Microsoft and others like IBM, CA, Nortel, Novell, U.S. Department of Defense, and VeriSign collaborated with OASIS, the international open standards consortium, to form a new group that fosters the use of information cards to universally manage personal digital identities. The OASIS Identity Metasystem Interoperability Technical Committee works to increase the quality and number of interoperable implementations of information cards.

The identity management space is complicated by issues that go beyond technical interoperability, such as policy-related operability, standards interoperability and privacy, to name a few. Improvements have been made, but interoperability will remain a work in progress for some time, not just for Microsoft, but for other industry groups, standards bodies, and technology companies as well.
Developer Tools and Runtime Work Stream

Acquisitions and mergers, as well as offshore and distributed development environments, leave many companies contending with developers using multiple and not always compatible development tools and runtimes. In addition, developers within the organization are using different code repositories. For example, Visual Studio programmers use Visual Studio’s built-in integration with Microsoft’s Team Foundation Server code repository, and Java developers use a different code repository, leaving companies vulnerable to lapses in version control.

IEC Council members have expressed a strong desire for programmers to have the freedom to choose whichever tool they want to write a program, with all tools having the capability to integrate the code, whether it’s Java, PHP, or C#, into the same code repository in a similar manner. Demand for direct integration between .NET and other application platforms is also high, as is the desire to run .NET and Java programs in a single runtime environment.

Major topics within the Developer Tools and Runtime work stream include:

- The ability to use different development tools in a distributed environment
- Robust and high-performance interoperability between .NET and Java/mainframe applications
- Interoperability with open source languages and tools
- Consistent implementations of standard cryptology algorithms

Some of the issues and solutions that the IEC Council has worked on include the following:

<table>
<thead>
<tr>
<th>Category</th>
<th>Scenario/Issue</th>
<th>Solution</th>
<th>Solution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Studio IDE</td>
<td>Work with Subversion server from Visual Studio IDE</td>
<td>AnkhSVN—subversion add-in for Visual Studio; TortoiseSVN—subversion client for Windows Explorer</td>
<td>Third party</td>
</tr>
<tr>
<td>Team Foundation</td>
<td>Work with TFS from Eclipse IDE</td>
<td>Teamprise—access TFS server from Eclipse IDE client</td>
<td>Third party</td>
</tr>
<tr>
<td>Team Foundation</td>
<td>Sync TFS data with HP Mercury Quality Center</td>
<td>TFS Bug Item Synchronizer for Quality Center—synchronize QC defects with TFS work items</td>
<td>Third party</td>
</tr>
<tr>
<td>Silverlight</td>
<td>Ubiquitous runtime for Rich Internet Applications</td>
<td>Silverlight on Windows and Mac; publication of Extensible Application Markup Language (XAML) grammar and vocabulary under OSP</td>
<td>Product feature</td>
</tr>
<tr>
<td>Silverlight</td>
<td>Make Silverlight attractive to non-Windows developers</td>
<td>Eclipse tools plugin for Silverlight</td>
<td>Open source bridge</td>
</tr>
<tr>
<td>Runtimes</td>
<td>PHP, Python, Ruby developers on Windows/.NET</td>
<td>PHP on Windows Azure cloud services, SQL driver for PHP</td>
<td>Open source bridge</td>
</tr>
</tbody>
</table>

Details of some of the solutions follow.
Silverlight for Eclipse Developers
Microsoft has provided funding to Soyatec (an IT solutions provider and Eclipse Foundation member) to develop an Eclipse plug-in that enables Eclipse developers to create Microsoft Silverlight applications: The [Eclipse Tools for Silverlight project](#) is a cross-platform development environment designed to help developers build Silverlight applications using the Eclipse integrated development environment on Windows and Mac. The project has been submitted to the Eclipse Foundation and has been released as an open Eclipse project.

Enhanced Services for Visual Studio Integration
After gathering feedback from customers and industry partners alike, Microsoft has improved its [Visual Studio Integration Partner (VSIP) program](#) by providing easier access to Microsoft Visual Studio integration technology and expanding its co-marketing program to better serve the needs of tools software vendors and enterprise customers.

Easing Access to Key Technologies
As part of ongoing efforts around interoperability with products from other vendors, including open source software, Microsoft has added the technical specifications for XAML—the Extensible Application Markup Language—under its [Open Specification Promise](#) (OSP). The publication of XAML under the OSP is intended to simplify the building of applications using .NET by increasing transparency and forming an ecosystem of designers and developers around it.

Development Kits and Toolkits for PHP Developers Released on CodePlex
Microsoft has been providing funding to third parties to build software development kits (SDKs) and toolkits that enable PHP developers to leverage more easily some of the Microsoft technologies. For example, the Windows Azure SDK for PHP enables PHP developers to take advantage of Windows Azure, Microsoft’s cloud services platform. And the Toolkit for PHP with ADO.NET Data Services helps PHP developers connect their applications to .NET by taking advantage of ADO.NET Data Services, a set of features recently added to the .NET Framework that provide a simplified way to expose any sort of data in a RESTful manner. These projects are open source projects available on [CodePlex](#), Microsoft’s open source project hosting web site.
BPM and SOA Work Stream

Models allow business people to focus on business processes without having to delve into the technological plumbing, and IT staffs to concentrate on codifying the business services to reflect designs, changes, and improvements to those processes. Models are the common point of communications for business processes, and they document the connection points and the contracts between the processes. Enterprises use business process modeling, data modeling, and application modeling to build applications today.

Major topics within the Business Process Modeling (BPM) and Services Oriented Architecture (SOA) work stream include:

- Facilitating design, development, and management of business processes to run across multiple platforms and systems using multiple, interoperable frameworks and tools for architecture and modeling, including standards like Business Process Modeling Notation (BPMN), XML Process Definition Language (XPDL), Business Process Execution Language (BPEL) and others.
- Support for UML standards in various modeling tools and progress of the standard in OMG Standards group.
- Interchange of models across different tools using the XMI (XML Metadata Interchange) standard.

By using techniques such as object/relational mapping and data-source mapping, as well as integrated metadata management, organizations can link and synchronize their models. Interoperability issues typically arise from the use of different methodologies, tools, schemas, metadata repositories, and the desire to link and synchronize different models.

For the last decade or so, SOA has been the predominant method for building distributed and componentized applications, and WS-*/SOAP standards form the underlying platform for SOA. While the formation of WS-* standards has proven to be a collaborative effort through the Web Services Interoperability Organization (WS-I) with nearly all major vendors accepting them, the complexity and effort required to build interoperable solutions across multiple stacks from different vendors has been problematic.

Some of the issues and solutions that the IEC Council has worked on include the following:
Details of some of the solutions follow.

Industry Collaboration on Platform Interoperability
Microsoft has become a code contributor to the new Apache Stonehenge project, which is intended to build a set of example applications for SOA that spans languages and platforms and demonstrates best practices and interoperability. The Apache Stonehenge project is a collaboration among vendors and developers seeking to create a set of sample applications that demonstrate seamless interoperability across multiple underlying platform technologies using currently defined W3C and OASIS standard protocols.

UML in Visual Studio 2010
Microsoft rejoined the Object Management Group in July 2008 and has been an active member of the UML 2.3 Revision Task Force, along with IBM and other vendors.

The company is integrating support for UML in its Visual Studio 2010 development tools and the upcoming Oslo repository ("Oslo" is the code name for a set of future Microsoft modeling technologies). Visual Studio 2010 will have full UML support for Logical Class diagrams, Component diagrams, Use Case diagrams, Activity diagrams, and Sequence diagrams, which in effect provide UML tools for modeling across the software lifecycle. Microsoft also is working to improve the UML standard to enhance the development of .NET applications, and is committed to open standards and interoperability across UML tools.

Sharing “M” Language Specification with the Industry
Microsoft has announced plans to publish the specification for its code name “M” language under its OSP, making it possible for third parties and those involved in open source projects to build implementations for other runtimes, services, applications, and operating systems. At the recommendation of the IEC Council, Microsoft will continue to engage with third-party providers to encourage them to build tools supporting M on various platforms, including non-Windows environments.
Public Interoperability Policy Work Stream

Governments make a range of decisions that affect the level of interoperability experienced by users of information technology, both within government and in the private sector. These decisions fall into two primary categories.

First, governments are adopting an increasingly structured approach to architecting their IT systems to address interoperability issues among government users of IT and to create an effective interface between government IT systems and the IT systems used by citizens and vendors. How these architectures (sometimes called interoperability frameworks) are developed and deployed are of critical interest to both public and private sector CIOs.

Second, government policies in areas such as research and development spending, intellectual property, and standards development can directly affect innovation in the area of interoperability-related technologies and their deployment.

The Public Interoperability Policy work stream represents an opportunity for IEC Council members to raise and discuss issues across these areas. Major topics include:

- Guiding Microsoft in its approach to interoperability principles and related initiatives
- Informing Microsoft’s public policy positions for interoperability, intellectual property, privacy, and security

Not only have council members provided Microsoft with valuable feedback regarding the company’s stance on interoperability, its conduct in the marketplace, and the level of trust they have around the company’s interoperability strategies, but they also have outlined a series of actions they want Microsoft to carry out in relation to open source policies, working with standards bodies, and so on.

In response, Microsoft defined interoperability principles for all six of the company’s high volume products. These principles specify Microsoft’s commitment to interoperability for each product category and state that the company will document all the Windows Services protocols and the protocols for Office client applications such as Word, Excel, and PowerPoint, including how they communicate with SharePoint. Some of the areas that have been impacted by this work stream include:

- Microsoft’s interoperability principles
- Microsoft’s open source and software licensing policy—Microsoft’ CodePlex open source project community, Microsoft Public License, Microsoft Community Promise, and OSP
- How Microsoft works with partners and the open source community, including the Eclipse Foundation, Apache Foundation, Linux community, Microsoft-Novell Alliance, the independent CodePlex Foundation, and IVA
- Microsoft’s participation in various standards bodies, such as Ecma International, ISO-IEC, OASIS, W3C, ITU-T, ETSI, and IETF
Appendices

Appendix A: Key Microsoft Executives and Leaders Participating in the IEC Council

Microsoft supports the IEC Council at the highest levels of the company. Below is a list of key Microsoft executives and leaders who are involved with the IEC Council:

- Bob Muglia, president, Server & Tools Business, and executive sponsor of the council
- Craig Mundie, chief research and strategy officer, and executive sponsor of the council
- Brad Smith, senior vice president, general counsel, and executive sponsor of the council
- Jean Paoli, general manager, Interoperability Strategy
- Ted Maclean, general manager, Customer Advocacy
- Craig Shank, general manager, Interoperability Group
- Kamaljit Bath, principal program manager, Interoperability Strategy—IEC Council technical lead
- Connie Dean, director, Strategic Partnership
- Monty O’Kelley, director of technology, Microsoft-Novell Alliance
- Meghan Raftery, program manager, IEC Council
- Steve Mutkoski, senior standards strategist, Standards Policy Strategy Group

Appendix B: Microsoft Interoperability Principles

As a part of Microsoft’s journey to further increase the openness of its products and drive greater interoperability, opportunity, and choice, the company announced in February 2008 a broad-reaching set of changes to its technology and business practices. Specifically, Microsoft has chosen to implement four interoperability principles and corresponding actions across its high-volume business products. The principles are:

- **Ensuring open connections.** Microsoft is ensuring open connections to its high-volume products so that software developers, business partners, and competitors can better interact with those products and extend existing products or invent new solutions for customers.

- **Enhancing support for industry standards.** Microsoft will support relevant standards in its high-volume products and do so in a way that promotes even greater levels of interoperability than before.

- **Promoting data portability.** Microsoft will design its high-volume products and provide documentation to enable customers to access their stored data and use their data in other software products.
Fostering more open engagement with the community. Microsoft will build upon its recent work to increase its communication with the customer, IT, and open source communities to drive a collaborative approach to addressing interoperability and standards challenges.

To foster interoperability in the technology marketplace, Microsoft engineers interoperability into its products; works with the community of third parties in the marketplace; provides access to its technology through methods that include the licensing of intellectual property; and supports and contributes to a broad range of standards.

Appendix C: Microsoft Community Promise and Open Specification Promise

Microsoft ensures the freedom to implement certain technologies without concern about Microsoft intellectual property under terms defined by the Microsoft Community Promise (CP) and Open Specification Promise (OSP) — irrevocable promises from Microsoft designed to reassure developers and customers that the listed specifications can be implemented widely, including in open source development. You can find more information about Microsoft’s Community Promise and Open Specification Promise:

- [www.microsoft.com/interop/cp/default.mspx](http://www.microsoft.com/interop/cp/default.mspx)
www.microsoft.com/interop/osp/default.mspx

The Open Web Foundation (OWF) is an organization that is helping community-driven specifications to operate in a legally responsible way. Our employees have participated in the OWF since its inception and we have released several specifications under the Open Web Foundation Agreement (OWFa). Information regarding the Open Web Foundation is at http://openwebfoundation.org.

Appendix D: Open Source at Microsoft

Microsoft actively participates in open source projects and shares the common industry view that software users will continue to see a mixed IT environment of open source and proprietary software.

Microsoft’s open source strategy is grounded in the recognition of the value of openness to working with others – including open source communities – to help customers and partners succeed in today’s heterogeneous IT environments. This includes increasing opportunities for business partners regardless of their underlying development model and increasing opportunities for developers to learn and create, by combining community-oriented open source with traditional commercial approaches to software development.

Microsoft is engaging with open source communities to enable open source software innovation through well-documented formats, protocols and APIs, high-quality open source SDKs, and open source technical bridges to other heterogeneous technologies. Microsoft is also working with communities like Apache, Eclipse, PHP & Zend, OpenPegasus, and many others by conducting plug fests, contributing code, and providing funding to related open source projects.

Microsoft is the initiating sponsor of the CodePlex Foundation (www.codeplex.org), an independent foundation whose mission is to enable the exchange of code and understanding among software companies and open source communities.

Microsoft is dedicated to making Windows the best platform for running and hosting open source applications. It is engaged in many activities to enable Windows in this way, including enhancing performance to optimize open source libraries to run faster on Windows, providing test tools, and so on.

Microsoft and its customers benefit from the innovation provided by open source development methodologies and licensing, contribution to open source communities, and broader collaboration with industry partners and competitors.

You can find more information about Microsoft’s open source activities at http://www.microsoft.com/opensource/ and http://www.interoperabilitybridges.com
Appendix E: Interoperability Bridges & Labs Center

Microsoft’s Interoperability Bridges & Labs Center is dedicated to technical collaborative work that improves interoperability between Microsoft and non-Microsoft technologies. The site includes a live directory of no-charge, downloadable technical interoperability Bridges & Labs content, including demos, technical guidance, and related articles. The vast majority of the projects are open source.

The center is run by the Microsoft Interoperability Strategy Group working with the community at large.

Visit the center at http://www.interoperabilitybridges.com/
Appendix F: Interoperability Vendor Alliance (IVA)
The Interop Vendor Alliance is an industry group working to identify and share opportunities to better connect people, data, and diverse systems through better interoperability with Microsoft systems and to jointly market the interoperability solutions of its members.

The organization serves as a collaborative forum for developing and sharing common technology models, facilitating scenario-based testing of multivendor solutions, and communicating additional best practices to customers and partners.

Since its formation in 2006, alliance membership has more than doubled as the IVA has developed multiple interoperability labs, including System Management, Centralized Directory, Federated Identity, Content Management, and Open XML.

You can learn more by visiting [http://interopvendoralliance.com/](http://interopvendoralliance.com/).