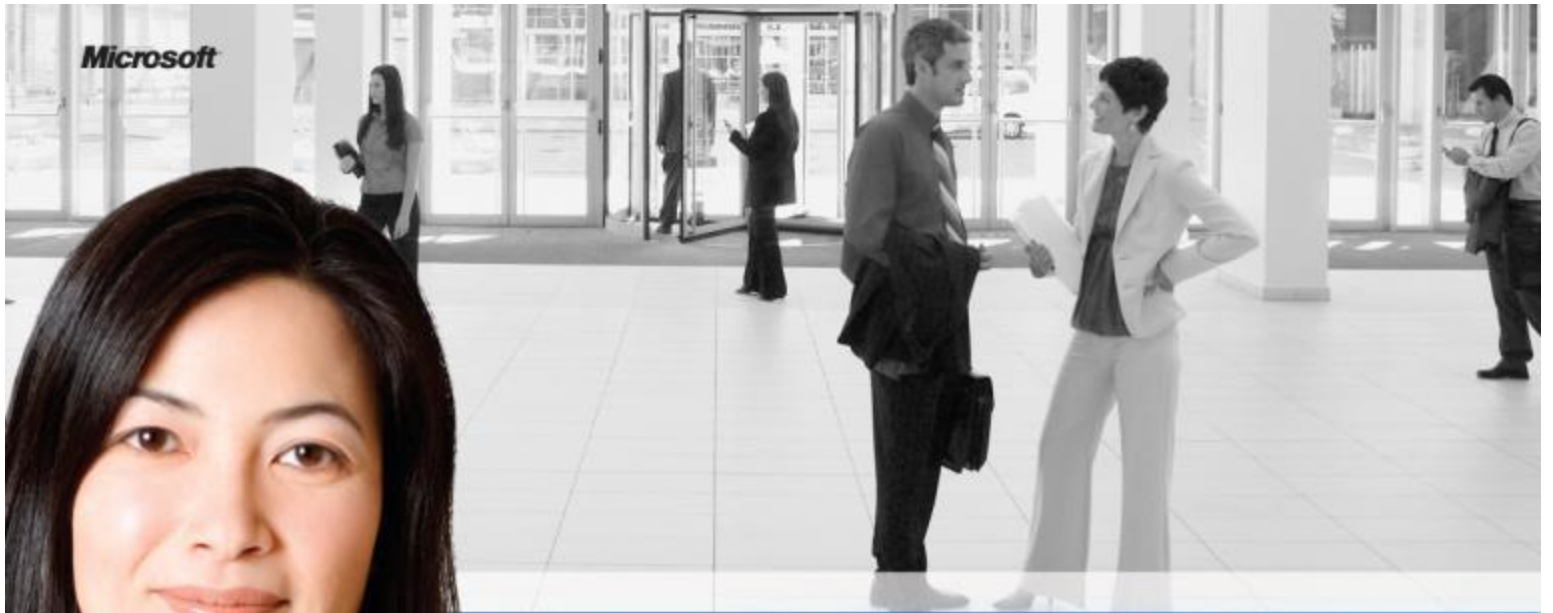


Microsoft



PERFORMANCE AND SCALABILITY

Bandwidth Utilization
Improvements

Microsoft Dynamics CRM 4.0

March 2008

CONTENTS

EXECUTIVE SUMMARY	1
RESULTS SUMMARY.....	1
OVERVIEW	2
TESTING METHODOLOGY	2
TUNING AND OPTIMIZATION	2
TEST RESULTS	3
CONCLUSION	6
RESOURCES	7



Bandwidth Utilization Improvements

Executive Summary

Microsoft Dynamics™ CRM business software is designed to help enterprise organizations achieve a 360-degree view of their customers across marketing, sales, and service. Engineered to deliver performance that meets the needs of the largest global deployments, Microsoft Dynamics CRM has been tested for user scalability, data scalability, and network performance. This white paper focuses on network scalability improvements.

Microsoft has made significant enhancements to the architecture of Microsoft Dynamics CRM 4.0 to improve network performance. Test results demonstrate network bandwidth utilization improvements of up to 94%. Improvements were evaluated in the number of round trips, bytes sent, and bytes received. Because the bandwidth utilization associated with a page can change after the first time the page is loaded, both initial (cold) and subsequent (warm) page loads were tested.

RESULTS SUMMARY

This table summarizes the findings from the network bandwidth utilization comparison:

Table 1: Benchmark Test Results Summary

	Network Traffic Reduction					
	Round Trips*		Bytes Sent**		Bytes Received**	
	Cold***	Warm***	Cold	Warm	Cold	Warm
Homepage	46%	22%	82%	48%	61%	70%
Sales History Report	8%	40%	33%	48%	42%	63%
Lead Form	29%	-	80%	61%	59%	74%
Contact Form	27%	33%	81%	61%	64%	76%
Marketing Tab	50%	33%	84%	59%	73%	73%
Campaign Form	30%	90%	84%	94%	66%	91%
Settings Tab	41%	17%	81%	56%	52%	49%
Advanced Find	32%	6%	77%	35%	69%	73%

* % decrease in round trips = (CRM 3.0 round trips - CRM 4.0 round trips) / CRM 3.0 round trips * 100

** % decrease in bytes = (CRM 3.0 bytes - CRM 4.0 bytes) / CRM 3.0 bytes * 100

*** Cold = results during first load of page; warm = results during subsequent page loads

MICROSOFT
DYNAMICS CRM 4.0
SHOWED
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IMPROVEMENTS OF
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MICROSOFT
DYNAMICS CRM CAN
BE CUSTOMIZED TO
PROVIDE
STREAMLINED
NETWORK
PERFORMANCE IN
GLOBAL ENTERPRISE
DEPLOYMENTS.

Overview

Microsoft Dynamics CRM 4.0 addresses the stringent requirements of the enterprise in the areas of performance and scalability, application flexibility, efficient manageability, and network configurability.

- **Performance and scalability:** Microsoft Dynamics CRM takes unique advantage of the Microsoft® Windows® operating system and Microsoft SQL Server® database platforms to provide enterprise levels of performance and scalability while keeping costs under control. Application tuning can be carried out using commonly-available skills and tools sets, and the application is designed for easy horizontal scaling through standard network load balancing methods.
- **Application flexibility:** Microsoft Dynamics CRM is engineered for change with point-and-click customization and a metadata-driven portable application model. The application is built on a highly flexible architecture based on industry standards such as Microsoft .NET, XML, and Web services.
- **Efficient manageability:** Microsoft Dynamics CRM helps improve application manageability through integration with enterprise systems management products such as Microsoft System Center Essentials. Multiple deployment models are available, including on-premise, hosted, and hybrid, and customers can change between deployment models seamlessly as their needs change.
- **Network configurability:** Microsoft Dynamics CRM 4.0 allows customers to provide a streamlined and high performance experience to users in global enterprise deployments. Microsoft Dynamics CRM components can be customized based on an organization's business model and bandwidth requirements to provide efficient bandwidth utilization for their environment.

Testing Methodology

The Microsoft team performed manual testing using 19 scenarios that represent a broad range of application functionality. The tests were run on the released versions of Microsoft Dynamics CRM 3.0 and Microsoft Dynamics CRM 4.0, and no customizations or optimizations were applied. The team used Fiddler, a network monitoring tool, to monitor network traffic and to capture traffic measurements for each page, measuring the amount of data that is sent and received.

Test scenarios were selected based on areas of the application that are heavily used across industries. Because the enhancements were made at the architecture level, similar levels of performance improvement can be expected in all areas of the application.

TUNING AND OPTIMIZATION

Both versions of the Microsoft Dynamics CRM application were installed without customizations or optimizations. Customers commonly optimize the application to deliver only the data that their users need to streamline the user experience and reduce the amount of data that is transferred. In these instances, customers may experience even greater improvements in network bandwidth utilization.

Test Results

The following tables show detailed results for the bandwidth utilization testing:

Table 2: Round trip bandwidth utilization comparison, cold

	Round trips		
	v3	v4	% improvement
Homepage	221	120	(46%)
OpenEmailForm	148	101	(32%)
ClickReports	14	9	(36%)
ClickSalesHistory	104	67	(36%)
ClickRunReport	50	46	(8%)
ClickOnSalesTab	20	11	(45%)
OpenLeadForm	112	80	(29%)
ClickOnContacts	6	6	--
OpenContactForm	124	90	(27%)
ClickOnMarketingTab	24	12	(50%)
ClickOnCampaigns	8	7	(13%)
OpenCampaignForm	86	60	(30%)
ClickOnServiceTab	80	52	(35%)
ClickOnSettingsTab	32	19	(41%)
ClickOnSecurityRoles	14	7	(50%)
OpenSalesperson	58	41	(29%)
ClickOnAdvancedFind	114	77	(32%)
SelectContacts	10	10	--
ClickFind	18	9	(50%)

Table 3: Bytes sent bandwidth utilization comparison, cold

	Bytes sent		
	v3	v4	% improvement
Homepage	457321	83977	(82%)
OpenEmailForm	310774	61545	(80%)
ClickReports	29191	6934	(76%)
ClickSalesHistory	219774	46987	(79%)
ClickRunReport	98814	66655	(33%)
ClickOnSalesTab	41774	7705	(82%)
OpenLeadForm	234106	46823	(80%)
ClickOnContacts	12519	4022	(68%)
OpenContactForm	259422	50465	(81%)
ClickOnMarketingTab	50090	8047	(84%)
ClickOnCampaigns	16630	4325	(74%)
OpenCampaignForm	179685	28295	(84%)
ClickOnServiceTab	174892	42243	(76%)
ClickOnSettingsTab	66804	12375	(81%)
ClickOnSecurityRoles	29317	6280	(79%)
OpenSalesperson	120739	19890	(84%)
ClickOnAdvancedFind	247165	57829	(77%)
SelectContacts	27389	20379	(26%)
ClickFind	40789	7728	(81%)

Table 4: Bytes received bandwidth utilization comparison, cold

	Bytes received		% improvement
	v3	v4	
Homepage	713030	277312	(61%)
OpenEmailForm	474013	166089	(65%)
ClickReports	51848	25995	(50%)
ClickSalesHistory	486243	152325	(69%)
ClickRunReport	201519	117751	(42%)
ClickOnSalesTab	81489	23239	(71%)
OpenLeadForm	409807	169077	(59%)
ClickOnContacts	59913	17132	(71%)
OpenContactForm	443495	157810	(64%)
ClickOnMarketingTab	86161	23371	(73%)
ClickOnCampaigns	51140	15114	(70%)
OpenCampaignForm	321820	108928	(66%)
ClickOnServiceTab	278223	119535	(57%)
ClickOnSettingsTab	75608	36005	(52%)
ClickOnSecurityRoles	41262	14543	(65%)
OpenSalesperson	238415	102214	(57%)
ClickOnAdvancedFind	515208	160251	(69%)
SelectContacts	41171	10793	(74%)
ClickFind	67673	17221	(75%)

Table 5: Round trip bandwidth utilization comparison, warm

	Round trips		% improvement
	v3	v4	
Homepage	18	14	(22%)
OpenEmailForm	4	6	50%
ClickReports	2	3	50%
ClickSalesHistory	14	10	(29%)
ClickRunReport	20	12	(40%)
ClickOnSalesTab	4	4	--
OpenLeadForm	6	4	(33%)
ClickOnContacts	2	4	100%
OpenContactForm	6	4	(33%)
ClickOnMarketingTab	6	4	(33%)
ClickOnCampaigns	8	3	(63%)
OpenCampaignForm	42	4	(90%)
ClickOnServiceTab	6	10	67%
ClickOnSettingsTab	6	5	(17%)
ClickOnSecurityRoles	4	4	--
OpenSalesperson	2	2	--
ClickOnAdvancedFind	18	17	(6%)
SelectContacts	10	10	--
ClickFind	4	2	(50%)

Table 6: Bytes sent bandwidth utilization comparison, warm

	Bytes sent		% improvement
	v3	v4	
Homepage	34656	17953	(48%)
OpenEmailForm	8582	7957	(7%)
ClickReports	4239	2993	(29%)
ClickSalesHistory	32997	17149	(48%)
ClickRunReport	41565	21558	(48%)
ClickOnSalesTab	8586	5290	(38%)
OpenLeadForm	12907	5092	(61%)
ClickOnContacts	4233	5170	22%
OpenContactForm	12907	5092	(61%)
ClickOnMarketingTab	12743	5288	(59%)
ClickOnCampaigns	16630	2963	(82%)
OpenCampaignForm	88407	5094	(94%)
ClickOnServiceTab	13497	17825	32%
ClickOnSettingsTab	12759	5647	(56%)
ClickOnSecurityRoles	8518	5222	(39%)
OpenSalesperson	4123	2439	(41%)
ClickOnAdvancedFind	46795	30644	(35%)
SelectContacts	27389	20379	(26%)
ClickFind	10644	4849	(54%)

Table 7: Bytes received bandwidth utilization comparison, warm

	Bytes received		% improvement
	v3	v4	
Homepage	136503	40817	(70%)
OpenEmailForm	68673	20123	(71%)
ClickReports	33287	10491	(68%)
ClickSalesHistory	64543	17811	(72%)
ClickRunReport	97116	35780	(63%)
ClickOnSalesTab	54693	15502	(72%)
OpenLeadForm	70040	17920	(74%)
ClickOnContacts	52963	25212	(52%)
OpenContactForm	86633	21068	(76%)
ClickOnMarketingTab	56870	15356	(73%)
ClickOnCampaigns	51140	10521	(79%)
OpenCampaignForm	158419	14583	(91%)
ClickOnServiceTab	85853	26638	(69%)
ClickOnSettingsTab	19983	10117	(49%)
ClickOnSecurityRoles	26077	11488	(56%)
OpenSalesperson	83627	29807	(64%)
ClickOnAdvancedFind	91056	24613	(73%)
SelectContacts	41171	10793	(74%)
ClickFind	43353	10352	(76%)

IN ITS CONTINUING
COMMITMENT TO
SUPPORTING GLOBAL
ENTERPRISES,
MICROSOFT HAS
MADE SIGNIFICANT
INVESTMENTS TO
IMPROVE NETWORK
PERFORMANCE
ACROSS THE
APPLICATION.

Conclusion

In its continuing commitment to supporting global enterprises, Microsoft has made significant investments to improve network performance across the application. Global organizations must deliver CRM applications over network links of varying capability, and Microsoft Dynamics CRM made architectural changes to improve network performance across all areas of the application. Microsoft Dynamics CRM can be easily optimized to deliver only the data that each user group needs, reducing network traffic while providing a more streamlined experience for users. The performance improvements demonstrated by the testing show that Microsoft Dynamics CRM can scale to meet the needs of dynamic and geographically dispersed business environments.

Resources

Resources related to Microsoft Dynamics CRM 4.0 in the enterprise:

- [Microsoft Dynamics CRM User Scalability for the Enterprise white paper](#)
- [Microsoft Dynamics CRM Bandwidth Utilization Improvements white paper](#)
- [Microsoft Dynamics CRM Database Scalability for the Enterprise white paper](#)
- [Microsoft Dynamics CRM Tuning and Optimization white paper](#)
- [Microsoft Dynamics CRM Performance and Scalability Toolkit](#)
- [Microsoft Dynamics CRM in the Enterprise brochure](#)
- [Microsoft Dynamics CRM Web Site](#)

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