A CONVERGED SOLUTION FOR YOUR CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM

Dell™ PowerEdge™ FC830 servers

Stay connected
with a high level of
CRM performance

**Ran many demanding
CRM tasks simultaneously**

**Scalable, flexible and
compact**

**Used an efficient
balance of resources**

**Powered by the
Intel® Xeon® processor
E5-4600 v3 product family**

Dell PowerEdge FX2 with Dell PowerEdge FC830 servers

Smart companies use all the tools at their disposal to increase sales and marketing efficiency. One of the most critical software tools for this is an effective customer relationship management (CRM) application. To get the most out of these applications, an enterprise needs a server solution that can run these demanding applications and provide excellent performance while executing many concurrent user tasks. When this solution is space-efficient, flexible, and scalable, the company benefits further.

In the Principled Technologies labs, we tested Microsoft Dynamics® CRM on the Dell PowerEdge FX2 enclosure with two Dell PowerEdge FC830 servers. This compact hardware solution, powered by the Intel Xeon processor ES-4650 v3, delivered reliable CRM performance in our tests, running nearly 100,000 tasks in under four hours, ensuring that a similar configuration for you could deliver solid performance for sales, marketing, and customer service staff. Plus, the dense, converged architecture of the PowerEdge FX2 focuses processing resources where needed, making it extremely attractive for IT admins looking to grow with less hardware sprawl.

CRM PERFORMANCE CAN TRANSLATE TO BUSINESS SUCCESS

For your employees who work in sales, marketing, and customer service, their CRM tool is an essential component of their job. Your sales staff needs real-time customer and competitive intelligence, the ability to work together to sell collaboratively, and ways to track sales data. Your marketing people rely on their CRM to plan, budget, and track across channels; manage leads and collaborate with sales; and connect with customers and prospects using social media. Your brand benefits enormously when your customer service department can use their CRM for information that lets them personalize every interaction.

If the servers that support your CRM application stack is not up to the task, it results in poor performance and can make these critical employees lose time, preventing your business from maximizing the value of this important tool. Selecting a dense, powerful server solution such as the Dell PowerEdge FX2 converged architecture can mitigate these problems.

HOW THE DELL POWEREDGE FX2 SUPPORTS MICROSOFT DYNAMICS

Microsoft Dynamics is a suite of business solutions that provides real-time information and allows for collaboration to engage with customers and make the most of customer relationships. The Microsoft Dynamics CRM 2015 Performance Toolkit[1] is a free tool that allows Dynamics CRM users to test their Dynamics CRM application. Microsoft® originally designed and documented the overall task count and load to represent 320 Dynamics CRM users completing hundreds of tasks including report generation, user creation, emails, administration tasks, and many other Dynamics CRM tasks.

In our labs, we used the Microsoft Dynamics CRM 2015 Performance Toolkit to learn about the Microsoft Dynamics performance of the Dell PowerEdge FX2 chassis with two Dell PowerEdge FC830 servers. In our testing, this solution ran 97,838 tasks in 3 hours, 37 minutes and 50 seconds and was able to perform an average of 7.48 tasks per second.[2]

Balanced resource use and plenty of headroom

IT admins prefer to work with servers that deliver reliable, steady performance and are able to balance application performance well. When applications evenly utilize available hardware, such as CPU and disk arrays, it adds flexibility for IT engineers to add other applications to the same hardware. They can also avoid the wasted resources that

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[1] The Microsoft Dynamics CRM 2015 Performance Toolkit is available for download at https://github.com/Microsoft/CRM-Performance-Toolkit.

[2] For more about the components of our testing, see Appendix A. For details on the configuration of the solution, see Appendix B. For the specifics of our testing, see Appendix C.

result when an application relies heavily on one hardware component while leaving another component underutilized.

The Dell PowerEdge FX2 solution we tested included two Dell PowerEdge FC830 servers each powered by four Intel Xeon processors E5-4650 v3 and 16 Intel SSDs. One of the FC830 servers ran the non-virtualized SQL Server® 2014 instance that held the CRM data and the other Dell PowerEdge FC830 ran four virtual machines running our Microsoft Dynamics CRM application (see Figure 1).

Dell PowerEdge FX2 Chassis

Dell PowerEdge FC830 server (CRM host)

VM **VM** **VM** **VM**

4% CPU utilization

53% RAM utilization

Dell PowerEdge FC830 server (SQL Server)

34% CPU utilization
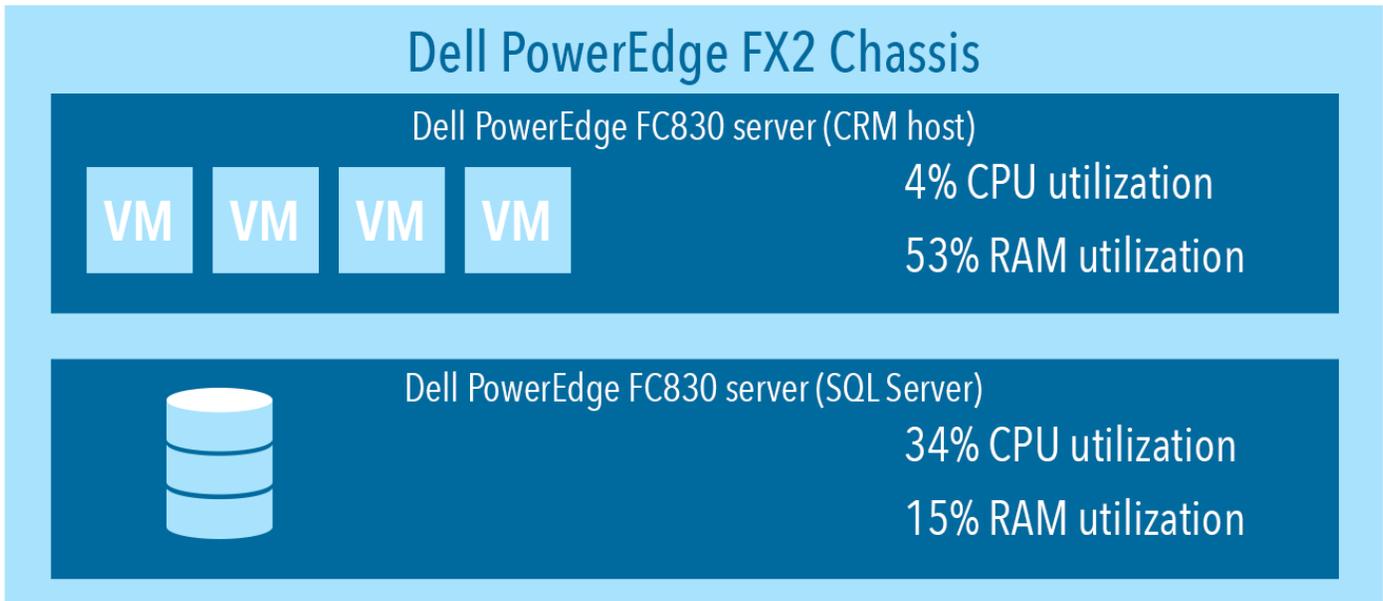
15% RAM utilization

Figure 1: Resource utilization of the two Dell PowerEdge FC830 servers in the FX2 solution we tested.

As Figure 1 shows, the server running SQL Server 2014 ran at 34 percent CPU utilization and 15 percent RAM utilization. The server running Microsoft Dynamics ran at 4 percent CPU utilization and 53 percent RAM utilization. These metrics indicate a relatively balanced use of resources and show that the solution offers room for growth. Other compute-intensive applications could run on the virtualized PowerEdge FC830 server containing the CRM server, considering its relative lower CPU utilization. Also in a configuration similar to ours, other databases, in addition to the CRM database, could be hosted on the SQL Server machine given its additional CPU and RAM capacity.

Flexibility and efficient use of datacenter space

Combining the compute power of the Intel Xeon processor E5-4600 v3 product family and the storage density of the FC830 blades, the Dell PowerEdge FX2 provides an all-in-one solution with the potential to save significant datacenter space as you upgrade your infrastructure to meet current and future needs.

The Dell PowerEdge FX2 enclosure features a modular design that can be customized with different combinations of compute and storage blocks to meet your

specific goals. The PowerEdge FX2 fits two full-width, four half-width, or eight quarter-width compute nodes to increase the compute density in your rack and optimize the space in your datacenter.

Being able to expand to up to four processors in each FC830 server gives your company the flexibility to increase compute performance without additional hardware. Our testing, including four Intel Xeon E5-4650 v3 processors in each Dell PowerEdge FC830, showed low CPU utilization during our CRM workload testing, leaving plenty of room for growth and additional workload execution.

IN CONCLUSION

In today's competitive marketplace, cultivating your relationships with current and future customers can be an important differentiating factor for your business. The CRM solution that your company uses gives your sales, marketing, and customer service groups a way to keep track of and to coordinate all their efforts to this end.

For such a critical component of your business intelligence plan, you want to select the appropriate hardware platform. In our testing, the Dell PowerEdge FX2 converged architecture was able to support Microsoft Dynamics performance with balanced resource utilization while using only 2U of rack space, making it a strong choice for your company's CRM needs.

APPENDIX A – ABOUT THE COMPONENTS OF OUR TESTING

About the Dell PowerEdge FX2 enclosure

The shared infrastructure approach of the Dell PowerEdge FX2 enclosure is scalable and can help you make the most of your datacenter space while reducing hardware sprawl. The Dell PowerEdge FX2 enclosure has a standard 2U footprint and features a modular design that can be customized with different combinations of compute and storage blocks to meet your specific goals. The PowerEdge FX2 fits two full-width, four half-width, or eight quarter-width compute nodes to increase the compute density in your rack and optimize the space in your datacenter. You can deploy the FX2 solution as you would deploy a traditional rack-mounted server while gaining the benefits and features that more expensive, dense blade solutions can provide. Important features of the FX2 enclosure include:

- Up to eight low-profile PCIe® expansion slots
- Two pass-through or optional networking FN I/O Aggregator modules
- Embedded network adapters within the server nodes
- Both chassis-based management through the Chassis Management Controller and rack-based management through Integrated Dell Remote Access (iDRAC) with Lifecycle Controller on each compute node

The Dell PowerEdge FX2 enclosure fits a number of server and storage options, including the PowerEdge FM120, FC430, FC630, and FC830 servers—all powered by Intel—and PowerEdge FD332 storage blocks. For more information about the Intel-powered Dell PowerEdge FX2 solution, visit www.dell.com/us/business/p/poweredge-fx/pd.

About the Dell PowerEdge FC830 server

Dell calls the PowerEdge FC830 the ultimate dense scale-up server. Powered by the Intel Xeon processor E5-4600 v3 product family, this full-width server offers power, scalability, and flexibility. The FC830 offers up to four 18-core processors, up to 3 TB of memory, and eight 2.5-inch drive bays or sixteen 1.8-inch drive bays of internal storage. Using the FC830 server, this configuration of the Dell PowerEdge FX2 chassis can contain either two FC830 servers or one FC830 server plus two FD332 storage blocks.

About Microsoft Dynamics

Microsoft Dynamics is a suite of business solutions that provide real-time information and allows for collaboration to engage with your customers and make the most of your customer relationships. According to Microsoft, "From customer engagement solutions powered by customer relationship management (CRM) software to enterprise resource planning (ERP), and from supply chain management to business intelligence and reporting, Microsoft Dynamics has a business solution that's just right for you." Learn more at www.microsoft.com/en-us/dynamics/.

About the test tool, the Microsoft Dynamics CRM 2015 Performance Toolkit

The Microsoft Dynamics CRM 2015 Performance Toolkit is a free tool that allows Dynamics CRM customers to test their Dynamics CRM application. Posted by Microsoft on GitHub® (latest version committed October 11, 2015), the toolkit leverages Microsoft SQL Server and Visual Studio® to run a series of Dynamics CRM tasks against the CRM server and application and hardware stack. The test as posted consists of 715 tasks ranging from report generation, user creation, emails, administration tasks, and many other Dynamics CRM tasks. These tasks run a set number of times for a total of 97,761 tasks in 3 hours, 37 minutes, and 50 seconds in our testing. Microsoft originally designed and documented the overall task count and load to represent 320 Dynamics CRM users. Microsoft does not disclose in the tool's documentation the data on which they based their user load assumptions.

We chose to run the CRM2015_320User_No_ECACT_Baseline test script from the October 11, 2015 version of the toolkit that we downloaded from GitHub, as Exchange integration was outside the scope of our study. We found undocumented functional issues in several of the 715 tasks; these issues resulted in 100 percent failure rates of the affected tasks. Visual Studio tasks can have several failure triggers related to any of a number of steps within each task. Because several of the tasks reporting failure in Visual Studio were likely still able to accomplish part of their jobs, we decided to leave them in the workload to keep the performance load as close as possible to the original expected load. Due to the task failures we were seeing, we felt that the performance load may no longer represent 320 users, so in this paper we report tasks completed in a fixed amount of time.

For more information regarding the test tool, refer to the documentation provided in the tool download found at https://github.com/Microsoft/CRM-Performance-Toolkit.

APPENDIX B – DETAILED SERVER CONFIGURATION

Figure 2 provides detailed configuration information for the test system.

Server	Dell PowerEdge FC830
Enclosure	
Blade enclosure	Dell PowerEdge FX2
General dimension information	
Height (inches)	3.5
Width (inches)	17
Depth (inches)	33.5
Power supplies	
Total number	2
Wattage of each (W)	1600
Cooling fans	
Total number	8 (2 + 6)
Dimensions (h x w) of each (inches)	3.3 x 3.5 (2), 2.5 x 2.5 (6)
Voltage (V)	12 (2), 12 (6)
Amps (A)	8 (2), 3.3 (6)
General processor setup	
Number of processor packages	4
Number of cores per processor package	12
Number of hardware threads per core	2
CPU	
Vendor	Intel
Name	Xeon E5-4650 v3
Socket type	FCLGA2011-3
Core frequency (GHz)	2.1
L1 cache	32KB +32KB (per core)
L2 cache	256KB (per core)
L3 cache	30MB
Platform	
Vendor and model number	Dell PowerEdge FC830
Motherboard model number	0NNF5RX03
BIOS name and version	Dell 1.1.5 (05/04/2015)
Memory modules	
Total RAM in system (GB)	256
Vendor and model number	Samsung® M393A1G43DB0-CPB
Type	PC4-2133
Speed (MHz)	2,133
Speed in the system currently running @ (MHz)	2,133
Timing/latency (tCL-tRCD-iRP-tRASmin)	15-15-15-33
Size (GB)	8
Number of RAM modules	32

Server	Dell PowerEdge FC830
Chip organization	Dual
Hard disks 1	
Vendor and Model Number	Intel SSDSC1NB08
Number of disks in the system	2
Size (GB)	80
Buffer size (MB)	N/A
RPM	N/A
Type	SATA SSD
Hard disks 2	
Vendor and Model Number	Intel SSDSC1BG20
Number of disks in the system	16
Size (GB)	200
Buffer size (MB)	N/A
RPM	N/A
Type	SATA SSD
Operating system	
Name	Microsoft Windows Server® 2012 R2 Datacenter Edition
Build number	9600
File system	NTFS
Language	English
Network adapter 1	
Type	Integrated
Vendor and model number	Broadcom® NetXtreme II 10 Gb Ethernet BCM57810
Storage controller 1	
Vendor and model number	Dell PERC H730 Mini
Cache size	1024MB

Figure 2: Configuration information for the test system.

APPENDIX C – HOW WE TESTED

Setting up and configuring the infrastructure server

We used a Dell PowerEdge R710 to host our client and Active Directory® environment. We installed Windows Server 2012 R2 Enterprise Edition, and added the Hyper-V® role. We then created two VMs to hold the AD role and client role respectively.

Configuring the Active Directory VM

1. Power on the Active Directory VM.
2. On the VM, open Server Manager.
3. On the Welcome screen, click 2, and click Add roles and features.
4. At the initial Before you begin screen, click Next three times.
5. At the Server Roles screen, select Active Directory Domain Services.
6. On the pop-up window, click Add Features.
7. Click Next three times.
8. Verify the desired role is being installed, and click Install.
9. Once installation has finished, close the Add roles and features wizard.
10. In Server Manager, click the flag at the top, and select the Promote this server to a domain controller link.
11. Select Add a new forest, enter a root domain name of `test.local` and click Next.
12. On the Domain Controller Options screen, enter a password, and click Next.
13. On the DNS Options screen, click Next.
14. On the Additional Options screen, click Next.
15. On the Paths screen, click Next.
16. On the Review Options screen, click Next.
17. On the Prerequisites screen, verify all prerequisites have passed, and click Install.
18. Once Active Directory Domain Services finishes installing, click Finish, and restart the system.
19. Create ServiceAccountsOU and CRM2015OU.
20. Create crmsvc (CRM2015OU).
21. Create srsssvc, and sqlsvc users (ServiceAccountsOU)
22. Create CRM users:
    a. Run the following command:
       ```
       for /L %i in (1,1,320) do net user crmusr%i Password1 /FULLNAME:"CRM
       user%i" /ADD /DOMAIN
       ```
    b. In Active Directory manager, select all newly created users (crmusr###), click Properties, Account tab, enable both checkboxes next to Password never expires, and click OK.

Configuring the SQL Server FC830 host

Our FC830 SQL Server host had sixteen 1.8-inch drive bays. We dedicated two of the bays for 80GB SSDs to create a RAID 1 to hold the OS. The other 14 bays held 200GB SSDs for the SQL Server database.

Installing Windows Server 2012 R2 Enterprise

1. Connect the installation media and power on the server.
2. When the option appears, press F11 to enter the Boot Manager.
3. Select the connected boot media, and press Enter.
4. Press any key when prompted to boot from DVD.

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5. When the installation screen appears, click My language is English.
6. Leave language, time/currency format and input method as default, and click Next.
7. Click Install now.
8. When the Windows Setup window appears, click No thanks when prompted to go online to install updates.
9. Select Windows Server 2012 R2 Enterprise (Server with a GUI), and click Next.
10. Check I accept the license terms, and click Next.
11. Click Custom: Install Windows only (advanced).
12. Select Drive 0 Unallocated Space, and click Next, at which point Windows will begin installing, and will restart automatically after completing.
13. When the Settings page appears, fill in the Password and Reenter Password fields with the same password.
14. Log in with the previously set up password.

Adding .NET 3.5
1. Open Server Manager, and click on Manage→ Add Roles and Features.
2. Click Next on the Before You Begin screen.
3. Choose Role-based or feature-based installation, and click Next.
4. Choose the target server, and click Next.
5. Leave the defaults for Server Roles, and click Next.
6. Select the box for .NET Framework 3.5 Features, and click Next.
7. Click Install.

Installing SQL 2014 with SP1
1. Connect the installation media to the server.
2. Click Run SETUP.EXE. If Autoplay does not begin the installation, navigate to the SQL Server 2014 DVD, and double-click.
3. If the installer prompts you with a .NET installation prompt, click Yes to enable the .NET Framework Core role.
4. In the left pane, click Installation.
5. On the Product Key screen, enter a product key for standard and click Next.
6. At the Setup Support Rules screen, wait for the rule check to complete. If there are no failures or relevant warnings, click OK.
7. Select the Specify a free edition and from the drop-down menu, select Evaluation. Click Next.
8. Click the checkbox to accept the license terms, and click Next.
9. If no failures are displayed after the setup support files are installed, click Next.
10. At the Setup Role screen, choose SQL Server Feature Installation.
11. At the Feature Selection screen, select:
    a. Database Engine Services
    b. Full-Text and Semantic Extractions for Search
    c. Reporting Services – Native
    d. Management Tools – Basic
    e. Management Tools – Complete
    f. SQL Client Connectivity SDK
12. Click Next.
13. At the Installation Rules screen, click Next after the check completes.

14. At the Instance configuration screen, leave the default selection of default instance, and click Next.
15. At the Disk Space Requirements screen, click Next.
16. At the Server Configuration screen, check that NT AUTHORITY\SYSTEM is selected for SQL Server Agent, the sqlsvc user is selected for SQL Server Database Engine, and the srsssvc user is selected for Reporting Services.
17. Click Next.
18. Assuming there are no failures, click Next.
19. At the Database Engine Configuration screen, select Mixed Mode.
20. Enter and confirm a password for the system administrator account.
21. Click Add Current user. This may take several seconds.
22. Click Next.
23. At the Error and usage reporting screen, click Next.
24. At the Installation Configuration Rules screen, check that there are no failures or relevant warnings, and click Next.
25. At the Ready to Install screen, click Install.
26. After installation completes, click Close.
27. Install CU4 for SQL 2014 SP1 with defaults.
28. Click Start, open the Report Services Configuration Manager, and click Connect.
29. Click on Web Service URL, and make sure the URL link works.

Configuring the CRM FC830 host

We created four VMs on the second FC830 server using Windows Hyper-V. We set up a load balancer to allow the workload to be equally spread cross the four VMs.

Installing Windows Server 2012 R2 Enterprise
1. Connect the installation media and power on the server.
2. When the option appears, press F11 to enter the Boot Manager.
3. Select the connected boot media, and press Enter.
4. Press any key when prompted to boot from DVD.
5. When the installation screen appears, click My language is English.
6. Leave language, time/currency format and input method as default, and click Next.
7. Click Install now.
8. When the Windows Setup window appears, click No thanks when prompted to go online to install updates.
9. Select Windows Server 2012 R2 Enterprise (Server with a GUI), and click Next.
10. Check I accept the license terms, and click Next.
11. Click Custom: Install Windows only (advanced).
12. Select Drive 0 Unallocated Space, and click Next, at which point Windows will begin installing, and will restart automatically after completing.
13. When the Settings page appears, fill in the Password and Reenter Password fields with the same password.
14. Log in with the previously set up password.

Adding the Hyper-V role
1. Open Server Manager, and click Manage→Add Roles and features.
2. At the Before You Begin screen, click Next.
3. At the Installation Type screen, click Next.

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4. At the Server Selection screen, select one of the servers in the failover cluster.
5. At the Server Roles screen, check the Hyper-V checkbox. At the prerequisite pop-up, click Add Features. Click Next.
6. At the Features screen, click Next.
7. At the Hyper-V screen, click Next.
8. At the Virtual Switches screen, choose your test network switch, click Next.
9. At the Migration screen, click Next.
10. At the Default Stores screen, click Next.
11. At the Confirmation screen, check to automatically restart the server after installation, and click Install.

Setting up the CRM VM

Set up four VMs—CRM01 to CRM04—and assign two virtual network adaptors.
1. Set static IP address on all servers (192.168.34.11-14,101-104).
2. Open Server Manager, and click Manage→Add Roles and Features.
3. Click Next on the Before You Begin screen.
4. Choose Role-based or feature-based installation, and click Next.
5. Select your server, and click Next.
6. Leave Defaults on the Server Roles screen, and click Next.
7. Check the box for Network Load Balancing, accept the Add Features popup, and click Next.
8. Click Install.
9. Click Start, and type `Network Load Balancing Manager` to search for the NLB manager.
10. Open the manager, and click Cluster→New.
11. New Cluster Host: CRM01, click Connect, select interface with secondary static IP (ex: 192.168.34.101), and click Next.
12. Add a cluster IP address (192.168.34.100).
13. Full Internet Name: CRMNLB.test.lan.
14. Select Multicast.
15. Add additional hosts to the cluster.
16. Once the NLB cluster is converged on all servers, create a static entry in the DNS for CRMNLB pointing to the cluster IP address (192.168.34.100).

Installing CRM Server on all CRM VMs (first VM is slightly different from other three VMs)

Note: The first VM differs slightly from the other three VMs (see the note after step 31).
1. Click Start, and type users to search for the user manager. Click on Edit user and groups in the search results.
2. Click on Groups in the left pane.
3. Double-click Performance Monitor Users to open the properties window.
4. Click Add…
5. Enter the crmsvc user, and click Check Names. Click OK.
6. Repeat steps 4 and 5 for Performance Log users.
7. Click OK, and close the user manager.
8. Double-click the CRM2015-Server-ENU-amd64 EXE, and click Run.
9. Choose the administrator folder, and click OK.
10. Choose Get updates for Microsoft Dynamics CRM (recommended), and click Next.
11. When the update check has completed, click Next.

12. Enter the product key, and click Next.
13. Accept the License Agreement, and click I Accept.
14. On the Download and Install Required Components window, click Install.
15. Click Yes on the popup window.
16. When the required components have finished installing, click Next.
17. Leave the default installation location, and click Next.
18. Enter the name of the SQL server, choose Connect to, select new deployment, and click Next.
19. Enter the crmsvc user name and password in all fields, and click Next.
20. Choose Select a Website, and leave the Default Web Site option. Click Next.
21. Leave the Email router server name blank, and click Next.
22. Enter an organization name in the Display Name field.
23. Hit Tab to auto fill the Unique Database Name field.
24. Leave the rest as defaults, and click Next.
25. Leave defaults, and click Next.
26. Enter the name of the SQL server, and click Next.
27. Leave defaults, and click Next.
28. Choose I don't want to use Microsoft Update, and click Next.
29. Once the system checks have finished, click Next.
30. Click Install.
31. Click Finish.

Note: For the rest of the CRM VMs, same instructions, but at step 18 you choose: connect to existing deployment. Accept defaults and click next for all subsequent screens until installation is finished.

Installing the 0.2 update on all CRM VMs
1. Download the CRM2015-Server-KB3075889-ENU-Amd64 file.
2. Double-click the .exe, and click Next.
3. Accept the license agreement, and click Next.
4. Choose to restart the system, and click Finish.

Installing the 0.2 update on the SQL server
1. Download the CRM2015-Srs-KB3075889-ENU-Amd64 file.
2. Double-click the .exe, and click Next.
3. Accept the license agreement, and click Next.
4. Choose to restart the system, and click Finish.

Setting up the client

Back on the Infrastructure server, we created a second VM with Windows Server 2012 R2 installed on it for the test client. We gave the VM a static IP, and joined it to the domain.

Installing Visual Studio 2013 Ultimate
1. Connect the installation media to the VM.
2. Leave the default installation directory.
3. Check the box to agree to the license terms.
4. Uncheck the box to join the improvement program, and click Next.
5. Leave default features, and click Install.

6. When setup completes, click Launch to verify it installed properly.

Installing SQL

1. Connect the installation media to the VM.
2. Click Run SETUP.EXE. If Autoplay does not begin the installation, navigate to the SQL Server 2014 DVD, and double-click.
3. If the installer prompts you with a .NET installation prompt, click Yes to enable the .NET Framework Core role.
4. In the left pane, click Installation.
5. On the Product Key screen, enter a product key for standard and click Next.
6. At the Setup Support Rules screen, wait for the rule check to complete. If there are no failures or relevant warnings, click OK.
7. Select the Specify a free edition and from the drop-down menu, select Evaluation. Click Next.
8. Click the checkbox to accept the license terms, and click Next.
9. If no failures are displayed after the setup support files are installed, click Next.
10. At the Setup Role screen, choose SQL Server Feature Installation.
11. At the Feature Selection screen, select:
    a. Database Engine Services
    b. Full-Text and Semantic Extractions for Search
    c. Reporting Services – Native
    d. Management Tools – Basic
    e. Management Tools – Complete
    f. SQL Client Connectivity SDK
12. Click Next.
13. At the Installation Rules screen, click Next after the check completes.
14. At the Instance configuration screen, leave the default selection of default instance, and click Next.
15. At the Disk Space Requirements screen, click Next.
16. At the Server Configuration screen, check that NT AUTHORITY\SYSTEM is selected for SQL Server Agent, the sqlsvc user is selected for SQL Server Database Engine, and the srsssvc user is selected for Reporting Services.
17. Click Next.
18. Assuming there are no failures, click Next.
19. At the Database Engine Configuration screen, select Mixed Mode.
20. Enter and confirm a password for the system administrator account.
21. Click Add Current user. This may take several seconds.
22. Click Next.
23. At the Error and usage reporting screen, click Next.
24. At the Installation Configuration Rules screen, check that there are no failures or relevant warnings, and click Next.
25. At the Ready to Install screen, click Install.
26. After installation completes, click Close.
27. Install CU4 for SQL 2014 SP1 with defaults.

Installing CRM 2015 SDK (7.1.2)

1. Download the 2015 SDK.
2. Double-click the setup file.

3. Check the box to accept the license terms, and click Continue.
4. Leave the default folder, and click OK.
5. When the extraction is complete, click OK.

Installing .NET 4.5.2 Developer Pack
1. Download the Developer Pack.
2. Accept the license terms, and click Install.
3. Click Finish.

Adding .NET 3.5 Features
1. Open Server Manager, click Manage → Add Roles and Features.
2. Click Next.
3. Choose Role-based or feature-based installation, and click Next.
4. Choose Select a server from the server pool, and choose the client. Click Next.
5. Don't choose any roles, and click Next.
6. Choose .NET Framework 3.5 Features, and click Next.
7. Click Install.
8. When the install finishes, click Close.

Installing Windows Identity Foundation SDK 3.5
1. Download the Windows Identify Foundation SDK 3.5 installation package.
2. Double-click the .exe file.
3. Click Run.
4. Click Next on the Welcome screen.
5. Accept the License Agreement, and click Next.
6. Leave the default installation folder, and click Next.
7. When the install finishes, click Finish.

Installing the CRM Toolkit
1. Unzip the CRM Toolkit to the root of C: (C:\CRMToolKit).
2. Open PowerShell and navigate to C:\CRMToolkit\Setup
3. Run the following command: `.\ToolkitSetup.ps1 -adminName administrator -adminPassword Password1 -domainName test -crmServerName crmnlb -sqlServerName sql1 -orgName testOrg -configSku onprem -release CRM2015 -crmSdkBinDir "C:\CRMToolkit\CRM2015SDK\SDK\Bin" -crmSDKReservedDllPath "C:\Program Files\Microsoft Dynamics CRM\Client\res\web\bin" -outlookDllsPath "C:\Program Files\Microsoft Dynamics CRM\Client\res\web\bin" -ssl $false`
4. When the script is finished running, open Windows Explorer, and navigate to C:\CRMToolkit\ConfigSettings, and open ConfigSettings.xml
5. Using the find/replace option, replace the default password with your account password.
6. Verify that the rest of the information is correct, and save and close the XML.
7. Run EMDB_Setup.sql in SQL Manager.
8. Run loadtestresultsrepository.sql in SQL Manager.
9. Navigate to C:\CRMToolKit\CRM_Perf_Toolkit, and open CRM_Perf_Toolkit.sln in Visual Studio.
10. Click on Load Test → Manage Test Controller.

11. Click the … button for Load test controller, and enter the name of the SQL server (NOT the FQDN).
12. Click Test Connection. When the connection succeeds, click OK.
13. Close the Test Controller Manager.
14. Right-click the solution, and choose Properties.
15. Click on Configuration Properties, and click Configuration Manager…
16. In the Active solution configuration: dropdown list, choose CRM2015.
17. In the Active solution platform: dropdown list, choose Any CPU.
18. Click Close.
19. Click OK.
20. Copy the correct DLLs.
21. Delete the Outlook_Perf_Benchmark project.
22. Build the solution.
23. Edit the XML config files in C:\CRMToolkit\Binaries\XMLFiles\OrgDataFiles\ and \320UserBaselineData to make sure all hard-coded passwords match your user passwords.
24. Navigate to C:\CRMToolkit\Binaries\Scripts\ps and right-click/edit DataPopulation_320userBaseline.ps1.
25. Hardcode the configuration parameters into the script by changing `$params = "/actiontype:OrgStructureGenerator /domain:$($configProperties.domainName) /webserver:$($configProperties.webserver) /administrator:$($configProperties.userName) /password:$($configProperties.password) /authentication:$($configProperties.authenticationType) /discoveryserver:$($configProperties.webserver) /organization:$($configProperties.orgName) /sectorstart:1 /sectorcount:1"` to `$params = "/actiontype:OrgStructureGenerator /domain:test /webserver:crm /administrator:administrator /password:Password1 /authentication:activedirectory /discoveryserver:crm /organization:TestOrg /sectorstart:1 /sectorcount:1"`
26. Open PowerShell and navigate to C:\CRMToolkit\Binaries\Scripts\ps
27. Run the DataPopulation_320UserBaseline.ps1 script to populate the data.
28. Navigate to C:\CRMToolkit\CRM_Perf_Toolkit\EMDBLoader\bin\Debug and run the emdbloader.exe
29. To run the test, open the solution in Visual Studio, right-click the Run Settings near the bottom, and choose "run load test."

ABOUT PRINCIPLED TECHNOLOGIES

Principled Technologies®

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We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.