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Attachments  
for  
**Francis Marion University**  
Enterprise Resource Planning (ERP) System

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Table of Contents

Item 1: Microsoft Dynamics AX 2012 System Requirements .....3  
Item 2: Microsoft Dynamics® AX 2012 R3 Summary of Financial Benchmark .....4  
Item 3: CMC Software Development Process Overview .....5  
Item 4: CampusNet Service Level Agreement .....6  
Item 5: CampusNet Enterprise Cloud Agreement .....7  
Item 6: Master Agreement .....8  
Item 7: Data Sharing Policy.....9  
Item 8: Project Team Résumés .....10  
Item 9: Certificate of Insurance .....11  
Item 10: CampusNet Enterprise Cloud Diagram.....12

**Item 1: Microsoft Dynamics AX 2012 System Requirements**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.



## **Microsoft Dynamics AX 2012 System Requirements**

Microsoft Corporation

Published: January 2016



**Note:**

Some of the information in this guide applies only to Microsoft Dynamics AX 2012 R3 installations, and some information applies only to AX 2012 R2, AX 2012 Feature Pack, or AX 2012.

Unless otherwise noted in this guide, all other content applies to AX 2012, AX 2012 Feature Pack, AX 2012 R2, and AX 2012 R3.

## Microsoft Dynamics AX

Microsoft Dynamics is a line of integrated, adaptable business management solutions that enables you and your people to make business decisions with greater confidence. Microsoft Dynamics works like and with familiar Microsoft software, automating and streamlining financial, customer relationship, and supply chain processes in a way that helps you drive business success.

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# Table of Contents

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- System requirements for Microsoft Dynamics AX 2012 ..... 4
  - Network requirements ..... 4
    - Network response time ..... 4
    - Local area network (LAN) environments ..... 4
    - Wide area network (WAN) environments ..... 5
  - Domain requirements..... 5
  - Hardware requirements ..... 5
    - Basic hardware requirements ..... 6
    - Processor and RAM requirements ..... 7
  - Software requirements for all computers ..... 8
  - Software requirements for server computers ..... 8
    - Supported server operating systems ..... 9
    - Software requirements for database servers ..... 9
    - Software requirements for other Microsoft Dynamics AX server components ..... 13
    - Virtual server support ..... 19
  - Software requirements for client computers ..... 20
    - Supported client operating systems ..... 20
    - Software requirements for the Microsoft Dynamics AX client ..... 21
    - Software requirements for other client components ..... 24
    - Supported software for version control ..... 25
    - Virtual client support ..... 25
  - Hardware and software requirements for Retail components ..... 26
    - Hardware requirements for communications servers ..... 27
    - Hardware requirements for the channel database computer ..... 28
    - Hardware requirements for a point-of-sale computer ..... 28
    - Supported peripheral devices for Retail ..... 28
    - Supported operating systems for Retail components ..... 29
    - Supported server operating systems for Retail components ..... 29
    - Supported client operating systems for Retail components ..... 30
    - Database requirements for retail databases ..... 32
    - Additional software requirements for Retail components..... 32
  - 64-bit operating system support ..... 35

# System requirements for Microsoft Dynamics AX 2012

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Before you install Microsoft Dynamics AX 2012, make sure that the system that you are working with meets or exceeds the minimum network, hardware, and software requirements.

**Important:**

Microsoft Dynamics AX 2012 R3 is officially supported on Microsoft Azure when deployments are performed through [Microsoft Dynamics Lifecycle Services](#). For deployment instructions, see [Deploy Microsoft Dynamics AX 2012 R3 on Azure using Lifecycle Services \(LCS\)](#).

Deployments of Dynamics AX 2012 R3 are not supported on Azure when performed outside of Microsoft Dynamics Lifecycle Services.

## Network requirements

Microsoft Dynamics AX can operate on networks that use Internet Protocol Version 4 (IPv4) or Internet Protocol Version 6 (IPv6).

Consider the network environment when you plan the system, and use the following guidelines.

### Network response time

The following table lists the minimum network requirements for the connection between the client and the Application Object Server (AOS) and the connection between the AOS and the database in a Microsoft Dynamics AX system.

Value	Client to AOS	AOS to database
Bandwidth (b)	100 megabits per second (Mbps)	100 Mbps

The total response time for running a task in Microsoft Dynamics AX is expressed by the following formula:

$$\text{Response time} = (\text{Number of calls to and from the server} * \text{Latency}) + \text{Number of bytes sent}/b$$

 **Important:**

The higher the latency, the longer the response time. You are responsible for making sure that the response time caused by latency in the network is acceptable for your business.

### Local area network (LAN) environments

Connect directly through a Microsoft Dynamics AX Windows client. Windows Server Remote Desktop Services is not required.

### Wide area network (WAN) environments

Remote Desktop Services is not required when bandwidth constraints do not exist, and when user interactions on the client require six or fewer round trips. With an average of 100 milliseconds latency, we expect a delay of approximately 600 milliseconds. Customizations and data configurations will require optimization to reduce round trips to six or fewer round trips per user interaction.

In a WAN environment that uses legacy X++ reporting, connect by using Windows Server Remote Desktop Services or another remote connection product, regardless of network latency.

In a WAN environment that has more than 100 milliseconds peak latency, you must use Remote Desktop Services to deploy Microsoft Dynamics AX Windows clients.

Windows Server Remote Desktop Services, formerly Terminal Services, includes RD RemoteApp, RD Easy Print, and RD Web Access. For more information about how to use Remote Desktop Services, see the [Remote Desktop Services site](http://technet.microsoft.com/en-us/windowsserver/terminalservices/default.aspx) (<http://technet.microsoft.com/en-us/windowsserver/terminalservices/default.aspx>) on Microsoft TechNet.

Other Terminal Emulation software, within the Microsoft Support policy, may also be used where Remote Desktop Services is allowed.

#### **Important:**

The Outlook synchronization feature in the Sales and marketing module is not supported when the Microsoft Dynamics AX client is deployed by using Remote Desktop Services.

### Domain requirements

Consider the following domain requirements when you install Microsoft Dynamics AX:

- Computers that run base Microsoft Dynamics AX components must belong to an Active Directory domain, and Active Directory must be configured in native mode.

#### **Note:**

The following Retail components are not required to belong to a domain: Retail POS, Modern POS, channel databases and offline databases, Async Client, Retail Server, and Hardware station.

- Computers that run base Microsoft Dynamics AX components must have access to other computers in Active Directory. These computers may be either in the same domain or in another trusted domain.
- The domain controller must run in Windows 2008 mode or later.
- To support e-mail alerts in Microsoft Dynamics AX, an SMTP (Simple Mail Transfer Protocol) server must be present in the environment.

### Hardware requirements

This section of the document describes the hardware that is required to run Microsoft Dynamics AX.

Actual requirements vary, based on the system configuration and based on the applications and features that you decide to install. The following are some of the many factors that affect the choice of appropriate hardware for a Microsoft Dynamics AX installation:

## Microsoft Dynamics AX

- The number of transactions per hour.
- The number of concurrent users.
- The number of concurrent users of Enterprise Portal for Microsoft Dynamics AX.
- The number of remote connections.
- The number of locations.

For more information about the factors to consider when you select hardware, see [Planning hardware infrastructure](http://technet.microsoft.com/library/e10f80b4-7816-492f-976a4cb45c66ed65(AX.60).aspx) (http://technet.microsoft.com/library/e10f80b4-7816-492f-976a4cb45c66ed65(AX.60).aspx).

You can use the Microsoft Dynamics Lifecycle Services Usage profiler to gather data to help describe the projected usage of a Microsoft Dynamics AX implementation. For more information, see [Usage profiler \(Lifecycle Services, LCS\)](http://technet.microsoft.com/library/4b7e3232-21c4-4564-90ed1734d50a1caa(AX.60).aspx) (http://technet.microsoft.com/library/4b7e3232-21c4-4564-90ed1734d50a1caa(AX.60).aspx).

## Basic hardware requirements

The following hardware requirements apply to all computers in a Microsoft Dynamics AX system.

Item	Requirement
Processor	Intel Pentium/Celeron family or compatible Pentium III Xeon or higher processor. We recommend a processor speed of 1.1 GHz or faster.  <b>Important:</b> Microsoft Dynamics AX is not supported on Itanium 64-bit processors.
Monitor	Super VGA (1024x768) or higher resolution monitor
Other	A DVD drive is required for an installation from a DVD.

## Processor and RAM requirements

The following table lists the number of processors and amount of RAM that are required for server computers. Both minimum and recommended hardware are listed.



**Note:**

If other Microsoft software is installed on the same computer, the system must also comply with the hardware requirements for that software.

Server computers	
CPU cores	Minimum: 2 cores Recommended: 8 cores
RAM	Minimum: 8 GB Recommended: 14 GB <b>Note:</b> We recommend that you limit other server applications on the same computer as the AOS, such as Microsoft SQL Server, to 1 GB of RAM.

The following table lists the number of processors and amount of RAM that are required for client computers. Both minimum and recommended hardware are listed.

Client computers	
CPU cores	Minimum: 1 core Recommended: 2 cores
RAM	Minimum: 2 GB Recommended: 4 GB

## Software requirements for all computers

The following software must be present on a computer before any Microsoft Dynamics AX components can be installed:

- Microsoft .NET Framework

Version	Notes
.NET Framework 4.6	.NET Framework 4.6. Supported, but not required, with AX 2012 R2 <a href="#">cumulative update 8</a> and AX 2012 R3 <a href="#">cumulative update 9</a> .
.NET Framework 4.5	Required with AX 2012 R3. Supported, but not required, with earlier releases of AX 2012.
.NET Framework 4.0	Required with AX 2012 R2. Supported, but not required, with earlier releases of AX 2012.
.NET Framework 3.5 with Service Pack 1	Required for most components, including the Setup wizard, with the original release of AX 2012. For those components that require a later version of .NET Framework, it is listed as an additional requirement in this document.

- Microsoft Windows Installer 3.1 or Windows Installer 4.0

## Software requirements for server computers

The following Microsoft Dynamics AX components require a server installation:

- Databases
- Application Object Server (AOS)
- Enterprise Portal
- Enterprise Search
- Help Server
- Management Reporter for Microsoft Dynamics ERP
- Microsoft SQL Server Reporting Services extensions
- Microsoft SQL Server Analysis Services configuration
- Web services on Internet Information Services (IIS)
- Synchronization proxy for Microsoft Project
- Synchronization service for Microsoft Project

## Microsoft Dynamics AX

- Management utilities
- RapidStart Connector
- Warehouse Mobile Devices Portal
- VSS writer
- Connector for Microsoft Dynamics AX (Microsoft Dynamics CRM connector)
- Data Import/Export Framework

## Supported server operating systems

The following table lists the server operating systems that are supported for Microsoft Dynamics AX 2012 components.

Operating system	Notes
Windows Server 2012 R2 Standard Edition or Datacenter Edition	Windows Server 2012 R2 is supported with AX 2012 R3 and <a href="#">cumulative update 7</a> for AX 2012 R2.
Windows Server 2012 Standard Edition or Datacenter Edition	Windows Server 2012 is supported with AX 2012 R3, AX 2012 R2, and <a href="#">cumulative update 5</a> for AX 2012.
Windows Server 2008 R2 Standard Edition, Enterprise Edition, Web Edition, or Datacenter Edition	
Windows Server 2008 Standard Edition, Enterprise Edition, Web Edition, or Datacenter Edition, with Service Pack 2	Only 64-bit versions of Windows Server 2008 are supported.

### Note:

Although a server operating system is required for most Microsoft Dynamics AX server components, you can also install some server components on supported client operating systems. However, this kind of installation is supported only for demonstration or development. In a production environment, you must install the server components on a supported server operating system.

## Software requirements for database servers

Regardless of the version of SQL Server you use, the following requirements apply:

- Only 64-bit versions of SQL Server are supported.
- In a production environment, we recommend that you install the latest cumulative update for the version of SQL Server that you are using.

## Microsoft Dynamics AX

- Microsoft Dynamics AX supports Unicode collations that are case-insensitive, accent-sensitive, kana-sensitive, and width-insensitive. The collation must match the Microsoft Windows locale of the computers that are running instances of the AOS. If you are setting up a new installation, we recommend that you select a Windows collation instead of a SQL Server collation. For more information about how to select a collation for a SQL Server database, see the [SQL Server documentation](http://go.microsoft.com/fwlink/?linkid=119526) (<http://go.microsoft.com/fwlink/?linkid=119526>).
- In AX 2012 R3, SQL Server change tracking must be turned on for the Microsoft Dynamics AX database and retail channel databases.

The following table lists the supported versions of SQL Server for the Microsoft Dynamics AX databases. For the minimum hardware requirements for SQL Server, see <http://www.microsoft.com/sql/default.mspx>.

Requirement	Notes
<p>Microsoft SQL Server 2014, Standard Edition, Enterprise Edition, or Business Intelligence Edition.  <a href="#">Service Pack 1</a>            (<a href="http://www.microsoft.com/enus/download/details.aspx?id=35575">http://www.microsoft.com/enus/download/details.aspx?id=35575</a>) for Microsoft SQL Server 2014 is supported with the following updates:</p> <ul style="list-style-type: none"> <li>• <a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;3042171">Cumulative update 8</a>                (https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;3042171) for AX 2012 R2</li> <li>• <a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;3063879">Cumulative update 9</a>                (https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;3063879) for AX 2012 R3</li> </ul>	<ul style="list-style-type: none"> <li>• SQL Server 2014 is supported by default with AX 2012 R3. To use SQL Server 2014 with AX 2012 R2, you must install <a href="#">cumulative update 7</a>. To use SQL Server 2014 with AX 2012, you must install <a href="#">cumulative update 5</a>. To use the Data Import/Export Framework for AX2012 R2 with SQL Server 2014, see: <a href="#">Install the AX 2012 R2 CU7 version of the Data import/export framework for use with SQL Server 2014</a>.</li> <li>• For SQL Server 2014 hardware requirements, see <a href="#">Hardware and Software Requirements for Installing SQL Server 2014</a>                (<a href="http://msdn.microsoft.com/enus/library/ms143506(v=sql.120).aspx">http://msdn.microsoft.com/enus/library/ms143506(v=sql.120).aspx</a>).</li> </ul>
<p>SQL Server 2012, Standard Edition, Enterprise Edition, or Business Intelligence Edition.  <a href="#">Service Pack 1</a>            (<a href="http://www.microsoft.com/enus/download/details.aspx?id=35575">http://www.microsoft.com/enus/download/details.aspx?id=35575</a>) for Microsoft SQL Server 2012 is supported with the following updates:</p> <ul style="list-style-type: none"> <li>• <a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2828929">Cumulative update 5</a>                (https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2828929) for AX 2012</li> <li>• <a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2807685">Cumulative update 1</a>                (https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2807685) for AX 2012 R2</li> </ul>	<ul style="list-style-type: none"> <li>• SQL Server 2012 is supported by default with AX 2012 R3 and AX 2012 R2. To use SQL Server 2012 with an earlier version of AX 2012, you must install <a href="#">cumulative update 3</a>                (https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2709934) for AX 2012.</li> <li>• For SQL Server 2012 hardware requirements, see <a href="#">Hardware and Software Requirements for Installing SQL Server 2012</a>                (<a href="http://msdn.microsoft.com/enus/library/ms143506(v=sql.110).aspx">http://msdn.microsoft.com/enus/library/ms143506(v=sql.110).aspx</a>).</li> </ul>

## Microsoft Dynamics AX

Requirement	Notes
<p><a href="#">Service Pack 2 with Cumulative Update 2</a> or later (<a href="http://support.microsoft.com/kb/2983175">http://support.microsoft.com/kb/2983175</a>) for Microsoft SQL Server 2012 is supported with the following updates:</p> <ul style="list-style-type: none"> <li>• <a href="#">Cumulative update 7</a> for AX 2012, <a href="#">Cumulative update 7</a> for AX 2012 R2</li> <li>• AX 2012 R3</li> </ul> <p><a href="#">Service Pack 3</a> for Microsoft SQL Server 2012 is supported with the following updates:</p> <ul style="list-style-type: none"> <li>• <a href="#">Cumulative update 9</a> for AX 2012 R2</li> <li>• <a href="#">Cumulative update 10</a> for AX 2012 R3</li> </ul>	
<p>SQL Server 2008 R2, Standard Edition, Enterprise Edition, or Datacenter Edition.</p> <p><a href="#">Service Pack 1</a> (<a href="http://www.microsoft.com/download/en/details.aspx?id=26727">http://www.microsoft.com/download/en/details.aspx?id=26727</a>) is supported, but it is not required unless you are installing Reporting Services extensions.</p> <p><a href="#">Service Pack 2</a> (<a href="http://www.microsoft.com/enus/download/details.aspx?id=30437">http://www.microsoft.com/enus/download/details.aspx?id=30437</a>) is supported with <a href="#">cumulative update 4 for AX 2012</a>. (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2765124">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2765124</a>)</p> <p><a href="#">Service Pack 3</a> (<a href="http://www.microsoft.com/enus/download/details.aspx?id=44271">http://www.microsoft.com/enus/download/details.aspx?id=44271</a>) is supported with:</p> <ul style="list-style-type: none"> <li>• AX 2012 R3</li> <li>• <a href="#">Cumulative update 7 for AX 2012 R2</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2885603">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2885603</a>)</li> <li>• <a href="#">Cumulative update 7 for AX 2012</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2936810">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2936810</a>)</li> </ul>	<p>For SQL Server 2008 R2 hardware requirements, see <a href="#">Hardware and Software Requirements for Installing SQL Server 2008 R2</a> (<a href="http://msdn.microsoft.com/enus/library/ms143506(v=sql.105).aspx">http://msdn.microsoft.com/enus/library/ms143506(v=sql.105).aspx</a>).</p>

## Microsoft Dynamics AX

Requirement	Notes
<p>SQL Server 2008, Standard Edition or Enterprise Edition, with Service Pack 1.</p> <p>Service Pack 3 is supported with <a href="#">cumulative update 4</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KB/Display.a_spx?scid=kb;EN-US;2765124">https://mbs2.microsoft.com/Knowledgebase/KB/Display.a_spx?scid=kb;EN-US;2765124</a>) for AX 2012.</p>	<p>For SQL Server 2008 hardware requirements, see <a href="#">Hardware and Software Requirements for Installing SQL Server 2008</a> (<a href="http://technet.microsoft.com/enus/library/ms143506(v=sql.100).aspx">http://technet.microsoft.com/enus/library/ms143506(v=sql.100).aspx</a>).</p>

## Software requirements for other Microsoft Dynamics AX server components

Some Microsoft Dynamics AX server components have additional requirements. The following table lists these requirements.

Component	Additional requirements	Notes
Application Object Server (AOS)	<ul style="list-style-type: none"> <li>• .NET Framework 4.6 (supported, but not required, with AX 2012 R2 <a href="#">cumulative update 8</a> and AX 2012 R3 <a href="#">cumulative update 9</a>)</li> <li>–or–</li> <li>• .NET Framework 4.5 (required with AX 2012 R3, and supported with AX 2012 R2, AX 2012 Feature Pack, and <a href="#">cumulative update 5</a> for AX 2012)</li> <li>–or–</li> <li>• .NET Framework 4.0, with the hotfix from Knowledge Base article <a href="http://support.microsoft.com/kb/2390372">2390372</a> (<a href="http://support.microsoft.com/kb/2390372">http://support.microsoft.com/kb/2390372</a>) (required with AX 2012 R2, AX 2012 Feature Pack, and AX 2012)</li> <li>• SQL Server 2012 Native Client or SQL Server 2008 Native Client</li> </ul>	<ul style="list-style-type: none"> <li>• Install SQL Server Native Client on the AOS server if the AOS server is separate from the database server.</li> <li>• If you are using AX 2012 R3, you must install the SQL Server 2012 version of the Native Client, regardless of the version of SQL Server that you are using. If you are using AX 2012 R2, AX 2012 Feature Pack, or AX 2012, you must install the SQL Server 2008 version of the Native Client, regardless of the version of SQL Server that you are using.</li> </ul>

## Microsoft Dynamics AX

Component	Additional requirements	Notes
Enterprise Portal	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0 (supported with AX 2012 R3 and AX 2012 R2)</li> <li>• ASP.NET 2.0</li> <li>• Microsoft AppFabric 1.1</li> <li>• Microsoft SharePoint Foundation 2013 (supported with AX 2012 R3 and AX 2012 R2). <a href="#">Service Pack 1</a> is required with AX 2012 R3 and supported with <a href="#">cumulative update 7</a> for AX 2012 R2.</li> <li>–or–</li> <li>Microsoft SharePoint Server 2013, Standard Edition or Enterprise Edition (supported with AX 2012 R3 and AX 2012 R2). <a href="#">Service Pack 1</a> is required with AX 2012 R3 and supported with <a href="#">cumulative update 7</a> for AX 2012 R2.</li> <li>–or–</li> <li>SharePoint Foundation 2010. <a href="#">Service Pack 2</a> is supported with <a href="#">cumulative update 7</a> for AX 2012, <a href="#">cumulative update 7</a> for AX 2012 R2, and AX 2012 R3.</li> <li>–or–</li> <li>SharePoint Server 2010, Standard Edition or Enterprise Edition (Enterprise Edition recommended). <a href="#">Service Pack 2</a> is supported with <a href="#">cumulative update 7</a> for AX 2012, <a href="#">cumulative update 7</a> for AX 2012 R2, and AX 2012 R3.</li> <li>• SQL Server 2008 R2 Analysis Management Objects (AMO)</li> </ul>	<ul style="list-style-type: none"> <li>• In AX 2012 R3 and AX 2012 R2, AppFabric is required to run Enterprise Portal in a web farm. AppFabric is not required for single server Enterprise Portal deployments.</li> <li>• Because Enterprise Portal runs on SharePoint, the server where you install Enterprise Portal must meet the hardware and software requirements for the version and edition of SharePoint that you are using. For more information, see the <a href="#">TechCenter for SharePoint</a> (<a href="http://technet.microsoft.com/enUS/sharepoint/">http://technet.microsoft.com/enUS/sharepoint/</a>).</li> <li>• To create a Power View report that displays data from an analysis cube, you must install SharePoint Server 2010 or SharePoint Server 2013.</li> <li>• To use SharePoint 2013 with AX 2012 R2, you must install several updates. For more information, see <a href="#">Enterprise Portal on Microsoft SharePoint 2013</a> (<a href="http://technet.microsoft.com/library/5906047d-4a98-4e86-9f2df405e3d69b22(AX.60).aspx">http://technet.microsoft.com/library/5906047d-4a98-4e86-9f2df405e3d69b22(AX.60).aspx</a>).</li> <li>• SharePoint Server 2010 can support Enterprise Portal and Enterprise Search. If you plan to use SharePoint Foundation 2010 for Enterprise Portal, you must also install one of the search server applications that are listed for Enterprise Search.</li> <li>• In the original release of AX 2012, to deploy Enterprise Portal in an environment where ASP.NET impersonation and claims-based authentication are enabled, you must install the Microsoft Dynamics AX hotfix from Knowledge Base article <a href="#">2823664</a> (<a href="http://go.microsoft.com/fwlink/?LinkId=294944">http://go.microsoft.com/fwlink/?LinkId=294944</a>).</li> <li>• You must install the SQL Server 2008 R2 version of AMO, even if you are using a newer version of SQL Server.</li> </ul>

## Microsoft Dynamics AX

Component	Additional requirements	Notes
Enterprise Search	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0 (supported with AX 2012 R3 and AX 2012 R2)</li> <li>• ASP.NET 2.0</li> <li>• Windows PowerShell 2.0</li> <li>• Microsoft SharePoint Server 2013, Standard Edition or Enterprise Edition (supported with AX 2012 R3 and AX 2012 R2). <a href="#">Service Pack 1</a> is required with AX 2012 R3 and supported with <a href="#">cumulative update 7</a> for AX 2012 R2.</li> </ul> <p style="text-align: center;">–or–</p> <p>Microsoft Search Server 2010</p> <p style="text-align: center;">–or–</p> <p>Microsoft Search Server Express 2010</p> <p style="text-align: center;">–or–</p> <p>Microsoft Fast Search Server 2010</p> <p style="text-align: center;">–or–</p> <p>SharePoint Server 2010, Standard Edition or Enterprise Edition</p>	A Search Server application is required only if you are using SharePoint Foundation 2010. Search functionality is built into SharePoint Server 2010 and SharePoint 2013.
Help Server	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0 (supported with AX 2012 R3 and AX 2012 R2)</li> <li>• ASP.NET 4.0</li> </ul>	
Management Reporter server components	<p>For information about the requirements for Management Reporter, see the <a href="#">Management Reporter system requirements</a> (<a href="http://go.microsoft.com/fwlink/?LinkId=396441">http://go.microsoft.com/fwlink/?LinkId=396441</a>).</p>	

## Microsoft Dynamics AX

Component	Additional requirements	Notes
Reporting Services extensions	<ul style="list-style-type: none"> <li>Microsoft SQL Server Reporting Services</li> </ul> <p>The versions of SQL Server that are supported for Microsoft Dynamics AX also support Reporting Services extensions, with the following differences:</p> <ul style="list-style-type: none"> <li>To create a Power View report that displays data from an analysis cube, you must use SQL Server 2012 Reporting Services with Service Pack 1 and <a href="http://support.microsoft.com/kb/2833645">cumulative update package 4</a> (<a href="http://support.microsoft.com/kb/2833645">http://support.microsoft.com/kb/ 2833645</a>) or a later update. Reporting Services must be installed in SharePoint integrated mode.</li> <li>If you are using SQL Server 2008 Reporting Services, <a href="http://www.microsoft.com/enus/download/details.aspx?id=12548">Service Pack 2</a> (<a href="http://www.microsoft.com/enus/download/details.aspx?id=12548">http://www.microsoft.com/enus/download/details.aspx?id=125 48</a>) with <a href="http://support.microsoft.com/kb/2498535">cumulative update package 3</a> (<a href="http://support.microsoft.com/kb/2498535">http://support.microsoft.com/kb/ 2498535</a>) or a later update for SQL Server 2008 is required.</li> </ul> <p>For more information about the supported versions of SQL Server, see the <a href="#">Software requirements for database servers</a> section of this document.</p> <ul style="list-style-type: none"> <li><a href="http://support.microsoft.com/kb/968929">Windows PowerShell 2.0</a> (<a href="http://support.microsoft.com/kb/968929">http://support.microsoft.com/kb/968929</a>)</li> </ul>	<ul style="list-style-type: none"> <li>Starting with AX 2012 R2, the Reporting Services integration is supported on a report server that is configured to run in SharePoint integrated mode. SharePoint integrated mode is not supported with earlier versions of Microsoft Dynamics AX.</li> <li>The Reporting Services integration is not supported on computers where instances of Reporting Services 2005 and Reporting Services 2008 are installed side by side.</li> <li>By default, Windows PowerShell 2.0 is installed on Windows Server 2008 R2 and Windows Server 2012. On Windows Server 2008 Service Pack 2, Windows PowerShell 2.0 must be installed manually. Before you install version 2.0, make sure that <a href="http://technet.microsoft.com/enus/library/dd351188.aspx">version 1.0 has been removed</a> (<a href="http://technet.microsoft.com/enus/library/dd351188.aspx">http://technet.microsoft.com/enus/li brary/dd351188.aspx</a>).</li> </ul>

## Microsoft Dynamics AX

Component	Additional requirements	Notes
Analysis Services integration	<ul style="list-style-type: none"><li>• Microsoft SQL Server Analysis Services The versions of SQL Server that are supported for Microsoft Dynamics AX also support Analysis Services integration, with the following differences:</li><li>• To create a Power View report that displays data from an analysis cube, you must use SQL Server 2012 Analysis Services with Service Pack 1 and <a href="http://support.microsoft.com/kb/2833645">cumulative update package 4</a> (<a href="http://support.microsoft.com/kb/2833645">http://support.microsoft.com/kb/2833645</a>) or a later update.</li><li>• If you're using SQL Server 2012 Analysis Services, you must install <a href="http://support.microsoft.com/kb/2679368">cumulative update package 1</a> (<a href="http://support.microsoft.com/kb/2679368">http://support.microsoft.com/kb/2679368</a>) for SQL Server 2012. For more information about the supported versions of SQL Server, see the <a href="#">Software requirements for database servers</a> section of this document.</li><li>• SQL Server Management Studio</li><li>• SQL Server Business Intelligence Development Studio (BIDS) if you are using SQL Server 2008 or SQL Server 2008 R2 or SQL Server 2012.</li></ul>	<p>If you are using Analysis Services 2012, it must be installed in multidimensional mode. The default analysis cubes that are included with Microsoft Dynamics AX cannot be deployed to an Analysis Services instance that is running in tabular mode.</p> <p>The Analysis Services integration is not supported on computers where instances of Analysis Services 2005 and Analysis Services 2008 are installed side by side.</p>

## Microsoft Dynamics AX

Component	Additional requirements	Notes
Web services on IIS	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• .NET Framework 4.6 (supported, but not required, with AX 2012 R2 <a href="#">cumulative update 8</a> and AX 2012 R3 <a href="#">cumulative update 9</a>)</li> <li>–or–</li> <li>• .NET Framework 4.5 (required with AX 2012 R3, and supported with AX 2012 R2, AX 2012 Feature Pack, and <a href="#">cumulative update 5</a> for AX 2012)</li> <li>–or–</li> <li>• .NET Framework 4.0 (required with AX 2012 R2, AX 2012 Feature Pack, and AX 2012)</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0 (supported with AX 2012 R3 and AX 2012 R2)</li> <li>• If you use web services to exchange documents with external partners, we recommend that you install the <a href="#">Windows SDK</a> (<a href="http://www.microsoft.com/downloads/details.aspx?FamilyId=E6E1C3DFA74F-4207-8586-711EBE331CDC">http://www.microsoft.com/downloads/details.aspx?FamilyId=E6E1C3DFA74F-4207-8586-711EBE331CDC</a>).</li> </ul>	<p>The Windows SDK contains tools that make it easier to configure Web services. In particular, the Windows Communication Foundation (WCF) Configuration Editor Tool, SvcConfigEditor.exe, provides a graphical user interface (GUI) that you can use to create and modify configuration settings. Therefore, you do not have to directly modify XML configuration files.</p>
Synchronization proxy for Microsoft Project	<p>The environment must include a computer that is running the synchronization service and a computer that is running Microsoft Project Server 2010.</p>	<p>To use the integration with Project Server, the synchronization proxy must be installed on the same computer as the Project Server Interface (PSI) Web service.</p>
Synchronization service for Microsoft Project	<p>Message Queuing, which is also known as MSMQ</p>	<p>Message Queuing must be installed on the computer where you are installing the synchronization service.</p>
Management utilities	<p><a href="#">Windows PowerShell 2.0</a> (<a href="http://support.microsoft.com/kb/968929">http://support.microsoft.com/kb/968929</a>)</p>	<p>By default, Windows PowerShell 2.0 is installed on Windows Server 2008 R2 and Windows Server 2012. On Windows Server 2008 Service Pack 2, Windows PowerShell 2.0 must be installed manually. Before you install version 2.0, make sure that <a href="#">version 1.0 has been removed</a> (<a href="http://technet.microsoft.com/enus/library/dd351188.aspx">http://technet.microsoft.com/enus/library/dd351188.aspx</a>).</p>

## Microsoft Dynamics AX

RapidStart Connector	No additional software requirements	
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Component	Additional requirements	Notes
Warehouse Mobile Devices Portal	<ul style="list-style-type: none"> <li>Web server role</li> <li>Internet Information Services (IIS) 7 or later versions</li> <li><a href="http://www.microsoft.com/enus/download/details.aspx?id=22079">ASP.NET MVC version 2 runtime (Retail)</a> (http://www.microsoft.com/enus/download/details.aspx?id=22079)</li> </ul>	
VSS Writer	Microsoft System Center 2012 Data Protection Manager (DPM) must be running in the environment.	
Connector for Microsoft Dynamics AX	For information about the requirements for Connector, see the <a href="http://go.microsoft.com/fwlink/?LinkId=325397">Connector Installation Guide</a> (http://go.microsoft.com/fwlink/?LinkId=325397).	
Data Import/Export Framework	SQL Server Integration Services	Install Integration Services on the same SQL Server version as the SQL Server instance that hosts the AX 2012 business and model store databases.
Management Pack for AX 2012	Microsoft System Center Operations Manager 2007 R2 with Service Pack 1 or Service Pack 2	
Management Pack for AX 2012 R3	Microsoft System Center Operations Manager 2012 R2 with Service Pack 1	
Mass deployment of AX 2012	Microsoft System Center Configuration Manager 2007 and 2012	

## Virtual server support

Microsoft Dynamics AX is certified on Windows Server 2008 and Windows Server 2012 with Hyper-V

## Microsoft Dynamics AX

Virtualization, and will support other virtualization solutions that participate in the Server Virtualization Validation Program, consistent with the guidelines that are listed for all Microsoft software as part of Knowledge Base article [897615](http://support.microsoft.com/kb/897615) (<http://support.microsoft.com/kb/897615>).

To use Hyper-V in a production environment, you must download the update for Windows Server 2008 that is described in Knowledge Base article [950050](http://support.microsoft.com/kb/950050) (<http://support.microsoft.com/kb/950050>). The beta version of Hyper-V, which is included by default with Windows Server 2008, is not supported.

## Software requirements for client computers

The following Microsoft Dynamics AX components can be installed on a client computer:

- Windows client
- Office Add-ins
- Remote Desktop Services integration
- Report Designer for Management Reporter
- Debugger
- Microsoft Visual Studio Tools
- Trace Parser
- .NET Business Connector

### **Note:**

These components can also be installed on any of the supported server operating systems.

## Supported client operating systems

The following table lists the client operating systems that are supported for Microsoft Dynamics AX 2012. Both 32-bit and 64-bit versions of client operating systems are supported.

Operating system	Notes
Windows 10 Pro, and Windows 10 Enterprise	Windows 10 is supported with <a href="#">cumulative update 8</a> for AX 2012 R2 and <a href="#">cumulative update 9</a> for AX 2012 R3 with hotfix <a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;3093274">3093274</a> ( <a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;3093274">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;3093274</a> ).
Windows 8.1 Pro and Windows 8.1 Enterprise	Windows 8.1 is supported with AX 2012 R3, <a href="#">cumulative update 7</a> for AX 2012 R2, and <a href="#">cumulative update 5</a> for AX 2012.  Modern POS requires Windows 8.1 Update (KB 2919355). Modern POS is available only with AX 2012 R3.
Windows 8 Pro and Windows 8 Enterprise	Windows 8 is supported with AX 2012 R3, AX 2012 R2, and <a href="#">cumulative update 5</a> for AX 2012.

## Microsoft Dynamics AX

Windows 7 Professional Edition, Ultimate Edition, or Enterprise Edition	
Windows Vista Business Edition, Ultimate Edition, or Enterprise Edition, with Service Pack 2	

### Software requirements for the Microsoft Dynamics AX client

The following table lists the software requirements that Microsoft Dynamics AX client computers must meet.

Requirement	Notes
<p>.NET Framework 4.6 (supported, but not required, with AX 2012 R2 <a href="#">cumulative update 8</a> and AX 2012 R3 <a href="#">cumulative update 9</a>)</p> <p>-or-</p> <p>.NET Framework 4.5 (required with AX 2012 R3, and supported with AX 2012 R2, AX 2012 Feature Pack, and <a href="#">cumulative update 5</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2828929">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2828929</a>) for AX 2012)</p> <p>-or-</p> <p>.NET Framework 4.0 (required with AX 2012 R2, AX 2012 Feature Pack, and AX 2012)</p>	

## Microsoft Dynamics AX

<p>One of the following web browsers is required for client computers that access Enterprise Portal.</p> <p>Internet Explorer</p> <ul style="list-style-type: none"><li>• Version 10 and version 11 are supported for all Microsoft Dynamics AX releases.</li><li>• Version 8 and version 9 are supported with AX 2012 R2 and earlier AX 2012 releases.</li></ul> <p>Mozilla Firefox</p> <ul style="list-style-type: none"><li>• Version 24 or later is required for AX 2012 R3.</li><li>• Version 11 or later is required for AX 2012 R2.</li><li>• Version 3.5 is the minimum version supported for earlier AX 2012 releases.</li></ul> <p>Safari</p> <ul style="list-style-type: none"><li>• Version 7 or later is required for AX 2012 R3.</li><li>• Version 5.1.2 is the minimum version supported for earlier AX 2012 releases.</li></ul>	<ul style="list-style-type: none"><li>• The browser version that you choose must be compatible with the version of SharePoint that you are using for Enterprise Portal.</li><li>• Internet Explorer 11.0 is supported by default with AX 2012 R3. To use Internet Explorer 11.0 with an earlier version of AX 2012, you must install the hotfixes listed in Knowledge Base article <a href="http://support.microsoft.com/kb/2958723">2958723</a> (<a href="http://support.microsoft.com/kb/2958723">http://support.microsoft.com/kb/2958723</a>).</li><li>• Internet Explorer 10.0 is supported by default with AX 2012 R3 and AX 2012 R2. To use Internet Explorer 10.0 with an earlier version of AX 2012, you must install <a href="#">cumulative update 5</a> for AX 2012.</li><li>• In AX 2012 R3 and AX 2012 R2, the Safari browser is supported by default for end-user tasks in Enterprise Portal. To use the Safari browser with an earlier version of AX 2012, you must install Microsoft Dynamics AX hotfix <a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2686124">2686124</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2686124">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2686124</a>). Enterprise Portal supports Safari only for end-user tasks in the portal. Enterprise Portal does not support Safari for developer or system administrator tasks.</li><li>• Web browser clients can run on many operating systems. However, those configurations are supported only for issues that can be reproduced when the browser runs on an operating system that is supported for Microsoft Dynamics AX.</li></ul>
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## Microsoft Dynamics AX

Requirement	Notes
<p>Office 2013</p> <p>Service Pack 1 is now supported with Microsoft Dynamics AX 2012 R3, Dynamics AX 2012 R2 <a href="#">cumulative update 7</a> and Dynamics AX 2012 <a href="#">cumulative update 7</a></p> <p>–or– Office 365</p> <p>–or– 2010 Microsoft Office release</p> <p>–or– 2007 Office release, Service Pack 3</p>	<ul style="list-style-type: none"> <li>A locally installed version of Office is required for Outlook, Microsoft Word, and Microsoft Excel integrations with Microsoft Dynamics AX.</li> <li>Office 365 subscriptions are supported, as long as the programs run locally on the client computer.</li> <li>Office 2013 is supported by default with AX 2012 R3 and AX 2012 R2. To use Office 2013 with an earlier version of AX 2012, you must install <a href="#">cumulative update 5</a> for AX 2012.</li> <li>To use the 64-bit version of Office 2013 with the Outlook Synchronization feature in the Sales and marketing module, you must download and install the Microsoft Dynamics AX hotfix <a href="#">2888503</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2888503">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2888503</a>).</li> </ul> <p><b>Important:</b></p> <p>The Outlook synchronization feature is not supported when the Microsoft Dynamics AX client is deployed by using Remote Desktop Services.</p> <ul style="list-style-type: none"> <li>To use Lync 2013 with AX 2012 R2, you must download and install the following hotfixes: <a href="#">2863156</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2863156">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2863156</a>) and <a href="#">2863199</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2863199">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2863199</a>).</li> <li>To use Lync 2013 with AX 2012, you must download and install the following hotfixes: <a href="#">2868424</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2868424">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2868424</a>) and <a href="#">2872755</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2872755">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;2872755</a>).</li> </ul>
<p>SQL Server 2008 R2 Analysis Management Objects (AMO)</p>	<p>AMO is required on client computers that are used to administer the OLAP database.</p> <ul style="list-style-type: none"> <li>x86 download: <a href="http://go.microsoft.com/fwlink/?LinkID=188447">http://go.microsoft.com/fwlink/?LinkID=188447</a></li> <li>x64 download: <a href="http://go.microsoft.com/fwlink/?LinkID=188448">http://go.microsoft.com/fwlink/?LinkID=188448</a></li> </ul> <p>You must install the SQL Server 2008 R2 version of AMO, even if you are using a newer version of SQL Server.</p>

## Software requirements for other client components

Some Microsoft Dynamics AX client components have additional requirements. The following table lists these requirements.

Component	Additional requirements	Notes
Office Add-ins	<ul style="list-style-type: none"> <li>Word or Excel</li> <li>Open XML SDK for Microsoft Office 2.0</li> <li>Visual Studio Tools for the Microsoft Office System (VSTO) 4.0</li> </ul>	Although Office is recommended for all client computers, you must install Word or Excel to use the Office Add-ins. For information about the supported versions, see the <a href="#">Software requirements for the Microsoft Dynamics AX client</a> section of this document.
Remote Desktop Services integration	No additional software requirements	
Report Designer for Management Reporter	For information about the requirements for Management Reporter, see the <a href="#">Management Reporter system requirements</a> ( <a href="http://go.microsoft.com/fwlink/?LinkId=39644">http://go.microsoft.com/fwlink/?LinkId=39644</a> ).	
Debugger	No additional software requirements	
Visual Studio Development Tools	<p>Windows PowerShell 2.0, and one of the following.</p> <p>For AX 2012 R3 with CU8:</p> <ul style="list-style-type: none"> <li>Visual Studio 2013, Professional Edition, Premium Edition, or Ultimate Edition with update 2 or later.</li> </ul> <p>For AX 2012 R3 without CU8, AX 2012 R2, AX 2012 Feature Pack, and AX 2012 RTM:</p> <ul style="list-style-type: none"> <li>Visual Studio 2010, Professional Edition, Premium Edition, or Ultimate Edition with Service Pack 1</li> </ul>	<p>Only Visual Studio 2013 is supported for development for AX 2012 R3 CU8.</p> <p>For AX 2012 R3, after you install Cumulative Update 8 or any binary hotfix released after Cumulative Update 8, you must use Visual Studio 2013 for AX development.</p> <p>Visual Studio 2010 and 2012 can be installed side by side with Visual Studio 2013 if needed. Different versions of the AX 2012 Visual Studio Development Tools cannot be installed side by side.</p>
Trace Parser	No additional software requirements	
.NET Business Connector	No additional software requirements	

## Supported software for version control

In a development environment, a central source control system is used to manage metadata changes when multiple developers are working on Microsoft Dynamics AX. The following table lists the version control systems that are supported with Microsoft Dynamics AX 2012.

Requirement	Notes
<p>Visual Studio Team Foundation Server 2013 (TFS) TFS 2013 is supported with the following updates:</p> <ul style="list-style-type: none"> <li>• AX 2012 R3</li> <li>• <a href="#">Cumulative update 7</a> for AX 2012 R2</li> <li>• <a href="#">Cumulative update 7</a> for AX 2012</li> </ul> <p>–or–</p> <p>Visual Studio Online (Team Foundation Version Control)</p> <p>–or–</p> <p>Team Foundation Server 2012 TFS 2012 is supported with the following updates:</p> <ul style="list-style-type: none"> <li>• <a href="#">Cumulative update 1</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2807685">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2807685</a>) for AX 2012 R2</li> <li>• <a href="#">Cumulative update 5</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2828929">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;EN-US;2828929</a>) for AX 2012</li> </ul> <p>–or–</p> <p>Team Foundation Server 2010</p>	<p>Client computers that are running Visual Studio 2010 must have <a href="http://support.microsoft.com/kb/2662296">hotfix KB 2662296</a> (<a href="http://support.microsoft.com/kb/2662296">http://support.microsoft.com/kb/2662296</a>) installed to use TFS source control with Microsoft Dynamics AX.</p> <p>Client computers that are not running Visual Studio 2010 must have the <a href="https://visualstudiogallery.msdn.microsoft.com/a37e19fb-3052-4fc9-bef7-4a4682069a75">Team Foundation Server 2010 SP1 Object Model</a> (<a href="https://visualstudiogallery.msdn.microsoft.com/a37e19fb-3052-4fc9-bef7-4a4682069a75">https://visualstudiogallery.msdn.microsoft.com/a37e19fb-3052-4fc9-bef7-4a4682069a75</a>) installed to use TFS source control with Microsoft Dynamics AX.</p> <p>For more information about how to use TFS with Microsoft Dynamics AX, see the white paper <a href="#">Change management and TFS integration for multi-developer projects</a> (<a href="http://go.microsoft.com/fwlink/?LinkId=264935">http://go.microsoft.com/fwlink/?LinkId=264935</a>).</p>

## Virtual client support

The Windows client for Microsoft Dynamics AX is certified to work as a virtual application on Microsoft Application Virtualization (App-V) 5.0. App-V 5.0 is supported by default with AX 2012 R3. For earlier releases of AX 2012, App-V 5.0 is supported with the following updates:

- [Cumulative update 1](#)  
(<https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;ENUS;2807685>) for AX 2012 R2
- [Cumulative update 5](#)  
(<https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;ENUS;2828929>) for AX 2012

App-V transforms applications into virtual services. When an application is virtual, it is no longer installed on a user's computer. Therefore, the application does not conflict with other applications. Updates are centrally managed, so that users are not prompted for updates or restarts.

## Hardware and software requirements for Retail components

The following sections list the hardware and software requirements for computers that are required to implement Retail.

At the head office, we recommend adding a communications server to the server configuration that is required by Microsoft Dynamics AX. At the store, we recommend a computer for each register, and a database server. For more information about the recommended topologies for Retail, see [Deployment topologies for Retail](http://technet.microsoft.com/library/eda17d27-a0e0-4117-92a96a7e52f1b917(AX.60).aspx) ([http://technet.microsoft.com/library/eda17d27-a0e0-4117-92a96a7e52f1b917\(AX.60\).aspx](http://technet.microsoft.com/library/eda17d27-a0e0-4117-92a96a7e52f1b917(AX.60).aspx)).

The following components are included in the Retail solution.

Component	Notes
Retail Headquarters	
Retail POS	
Modern POS	AX 2012 R3 only
Commerce Data Exchange: Synch Service	Called Retail Store Connect in AX 2012 Feature Pack
Commerce Data Exchange: Real-time Service	Called Retail Transaction Service in AX 2012 Feature Pack
Commerce Data Exchange: Async Server	AX 2012 R3 only
Commerce Data Exchange: Async Client	AX 2012 R3 only
Retail Channel Configuration Utility	Called Retail Store Database Utility in AX 2012 R2 and AX 2012 Feature Pack
Retail SDK	Called Retail POS Plug-ins in AX 2012 Feature Pack
Retail online channel	AX 2012 R3 and AX 2012 R2 only. Also known as Retail online store or the Microsoft Dynamics AX ecommerce solution.
Retail mass deployment toolkit	AX 2012 R3 only
Retail channel database	AX 2012 R3 only
Retail Server	AX 2012 R3 only

## Microsoft Dynamics AX

Component	Notes
Retail Hardware station	AX 2012 R3 only

### Hardware requirements for communications servers

The following table lists the hardware requirements for a communications server at the head office or at the store. A communications server runs Commerce Data Exchange components: Async Server, Async Client, Synch Service, and Real-time Service.

Item	Requirement
Processor	Minimum: Intel/AMD compatible 1.1 GHz (x86) or 1.4 GHz (x64) processor. Recommended: Intel/AMD compatible 2 GHz processor
RAM	Minimum: 1 GB Recommended: 2 GB
Available hard disk space	Minimum: 1.5 GB

## Hardware requirements for the channel database computer

The channel database computer hosts a SQL Server database, and therefore must meet SQL Server hardware requirements. For more information, see one of the following pages, depending on the version of SQL Server that you use:

- [Hardware and Software Requirements for Installing SQL Server 2014](http://msdn.microsoft.com/enus/library/ms143506(v=sql.120).aspx)  
(http://msdn.microsoft.com/enus/library/ms143506(v=sql.120).aspx)
- [Hardware and Software Requirements for Installing SQL Server 2012](http://msdn.microsoft.com/enus/library/ms143506(v=sql.110).aspx)  
(http://msdn.microsoft.com/enus/library/ms143506(v=sql.110).aspx)
- [Hardware and Software Requirements for Installing SQL Server 2008 R2](http://msdn.microsoft.com/en-us/library/ms143506(v=sql.105).aspx)  
(http://msdn.microsoft.com/en-us/library/ms143506(v=sql.105).aspx)
- [Hardware and Software Requirements for Installing SQL Server 2008](http://technet.microsoft.com/en-us/library/ms143506(v=sql.100).aspx)  
(http://technet.microsoft.com/en-us/library/ms143506(v=sql.100).aspx)

## Hardware requirements for a point-of-sale computer

The following table lists the hardware requirements for a point-of-sale register. The requirements apply regardless if an offline database is installed on the register computer. Each register computer that will be used to process card payments must also have Internet access.

Item	Requirement
Processor	Minimum: Intel/AMD compatible 1.4 GHz processor Recommended: Intel/AMD compatible 2 GHz processor
RAM	Minimum: 1 GB Recommended: 2 GB
Available hard disk space	Minimum: 1.5 GB
Item	Requirement
Monitor	Super VGA (1024 × 768) or higher-resolution monitor or a touch screen monitor
Mouse	Microsoft mouse or compatible pointing device

## Supported peripheral devices for Retail

Each store must have enough peripheral devices, such as receipt printers, cash drawers, magnetic stripe reader (MSR) devices, and personal identification number (PIN) pad devices, for each register in the store.

## Microsoft Dynamics AX

Retail supports the following types of OLE for Point of Sale (OPOS) devices for registers:

- Cash drawers
- Receipt printers
- Line or pole displays
- Dual displays (with a second monitor that faces the customer)
- MSRs
- Bar code scanners
- Scales
- Keylocks (keyboard locks for manager override keys)
- Keyboards
- PIN pads



### **Important:**

OPOS Common Control Objects, version 1.13, are required for peripheral devices. After using an installation utility provided by a hardware manufacturer, confirm that the Common Control Objects have not been overwritten by an earlier version. To help avoid performance issues, verify that you are using the correct service objects for the hardware devices that you are using.

Retail Modern POS can use peripheral devices connected to Retail Hardware station. In addition, Retail Modern POS can also use locally connected peripheral devices directly, without having to install a local IIS-based hardware station.

## Supported operating systems for Retail components

The following tables list the operating systems that are supported for Retail components. Unless otherwise indicated, you must install the latest service pack for each operating system.

### Supported server operating systems for Retail components

The following Retail components are supported on a server operating system:

- Async Server
- Real-time Service
- Retail SDK
- Retail online channel
- Retail mass deployment toolkit
- Retail channel database
- Retail Server
- Retail Hardware station

## Microsoft Dynamics AX

The following server operating systems are supported.

Operating system	Notes
Windows Server 2012 R2, Standard Edition or Datacenter Edition	Windows Server 2012 R2 is supported with AX 2012 R3 and <a href="#">cumulative update 7</a> for AX 2012 R2.
Windows Server 2012, Standard Edition or Datacenter Edition	Windows Server 2012 is supported with AX 2012 R3 and AX 2012 R2.
Windows Server 2008 R2 Standard Edition, Enterprise Edition, Web Edition, or Datacenter Edition	
Windows Server 2008 Standard Edition, Enterprise Edition, Web Edition, or Datacenter Edition	Only 64-bit versions of Windows Server 2008 are supported.

## Supported client operating systems for Retail components

The following Retail components are supported on a client operating system:

- Retail POS
- Modern POS
- Async Client
- Retail Server
- Retail Hardware station
- Retail channel databases
- Offline databases
- Retail SDK
- Retail mass deployment toolkit

The following client operating systems are supported. Both 32-bit and 64-bit versions of client operating systems are supported.

## Microsoft Dynamics AX

Operating system	Notes
<p>Windows 10, Windows 10 Pro, or Windows 10 Enterprise</p> <p>–or–</p> <p>Windows 8.1, Windows 8.1 Pro, or Windows 8.1 Enterprise</p> <p>–or–</p> <p>Windows 8, Windows 8 Pro, or Windows 8 Enterprise</p> <p>–or–</p> <p>Windows 7 Professional Edition, Ultimate Edition, or Enterprise Edition</p>	<ul style="list-style-type: none"> <li>• Windows 10 is supported with <a href="#">cumulative update 8</a> for AX 2012 R2 and <a href="#">cumulative update 9</a> for AX 2012 R3 with hotfix <a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;3093274">3093274</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;3093274">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;3093274</a>).</li> <li>• Windows 8.1 is supported with AX 2012 R3, <a href="#">cumulative update 7</a> for AX 2012 R2, and <a href="#">cumulative update 5</a> for AX 2012.</li> <li>• Windows 8 is supported with AX 2012 R3 and AX 2012 R2.</li> <li>• Modern POS requires Windows 8.1 Update (KB 2919355). Modern POS is available only with AX 2012 R3. If you have installed a pre-release version of Modern POS, you must uninstall it prior to installing the RTM version that is included in Cumulative update 8 for Microsoft Dynamics AX 2012 R3.</li> </ul>
<p>Windows Embedded 8.1 Industry Edition (Retail) or Pro Edition</p> <p>–or–</p> <p>Windows Embedded 8 Industry Edition (Retail) or Pro Edition</p> <p>–or–</p> <p>Windows Embedded POSReady 7</p> <p>—or—</p> <p>Windows Embedded POSReady 2009</p>	<ul style="list-style-type: none"> <li>• Windows Embedded is supported only for register computers in the store.</li> <li>• Windows Embedded 8.1 is supported with AX 2012 R3 and <a href="#">cumulative update 7</a> for AX 2012 R2.</li> <li>• Windows Embedded 8 is supported with AX 2012 R3 and AX 2012 R2.</li> <li>• Windows Embedded POSReady 7 is not supported for Retail components that are hosted in IIS.</li> <li>• Windows Embedded POSReady 2009 is supported only with AX 2012 R2 and AX 2012 Feature Pack. It is not supported with AX 2012 R3.</li> </ul> <p>Because Windows Embedded POSReady 2009 is based on the Windows XP operating system, it is incompatible with the AX 2012 installer. To install Retail POS on Windows Embedded POSReady 2009, you must use the instructions in <a href="#">this blog post</a> from the Microsoft Dynamics AX customer support team.</p>

## Database requirements for retail databases

The following table lists the supported software for channel databases, message databases, and offline databases.

Requirement	Notes
<p>Microsoft SQL Server 2014, Express Edition, Standard Edition, or Enterprise Edition</p> <p>–or–</p> <p>SQL Server 2012, Express Edition, Standard Edition, or Enterprise Edition</p> <p>–or–</p> <p>SQL Server 2008 R2, Express Edition, Standard Edition, Enterprise Edition, or Datacenter Edition</p> <p>–or–</p> <p>SQL Server 2008, Express Edition, Standard Edition, or Enterprise Edition, with Service Pack 2</p>	<ul style="list-style-type: none"> <li>SQL Server 2014 is supported with AX 2012 R3. To use SQL Server 2014 with AX 2012 R2, you must install <a href="#">cumulative update 7</a>. To use SQL Server 2014 with AX 2012, you must install <a href="#">cumulative update 5</a>.</li> <li>SQL Server 2012 is supported with AX 2012 R3 and AX 2012 R2.</li> <li>SQL Server Express editions are supported for channel databases, message databases, and offline databases. However, SQL Server Express editions are limited to a maximum of 10 GB storage, one physical processor, and 1 GB of internal memory.</li> <li>SQL Server change tracking is required for channel databases and message databases. Change tracking is available only in SQL Server Express with Advanced Services. It is not available in other SQL Server Express editions.</li> <li>Both 32-bit and 64-bit versions of SQL Server are supported.</li> </ul>

## Additional software requirements for Retail components

Some Retail components have additional requirements. The following table lists these requirements.

Component	Additional requirements	Notes
Retail Headquarters	Retail Headquarters must be installed on the same computers as the AOS and the Microsoft Dynamics AX client. Therefore, the supported operating systems for Retail Headquarters are the same as those for the AOS and the client.	
Retail POS	If the Retail POS register will include an offline database, you must install one of the supported versions of SQL Server.	

## Microsoft Dynamics AX

Component	Additional requirements	Notes
Modern POS	<ul style="list-style-type: none"> <li>• Windows 10 Supported with <a href="#">cumulative update 9</a> for AX 2012 R3 with hotfix <a href="#">3093274</a> (<a href="https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;3093274">https://mbs2.microsoft.com/Knowledgebase/KBDisplay.aspx?scid=kb;en-us;3093274</a>)</li> <li>• Windows 8.1  <b>Important:</b> Modern POS is supported only on Windows 8.1 Update (KB 2919355).</li> <li>• Microsoft Visual C++ Runtime Package (VCLibs) 12.0 (version number 12.0.2.1005.0 or higher)</li> <li>• Windows Library for JavaScript (WinJS) 2.0 (version number 1.0.9600.16408 or higher)</li> <li>• If the Modern POS register will include an offline database, you must install one of the supported versions of SQL Server.</li> </ul>	Retail Modern POS can use peripheral devices connected to Retail Hardware station. In addition, Retail Modern POS can also use locally connected peripheral devices directly, without having to install a local IIS-based hardware station.
Synch Service	No additional software requirements	
Real-time Service	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0</li> <li>• Hotfix for Windows PowerShell (KB 2701373)</li> </ul>	
Async Server	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0</li> <li>• Hotfix for Windows PowerShell (KB 2701373)</li> </ul>	
Async Client	No additional software requirements	
Retail Channel Configuration Utility (Retail Store Database Utility)	<ul style="list-style-type: none"> <li>• Hotfix for Windows PowerShell (KB 2701373)</li> <li>• Microsoft SQL Server Shared Management Objects</li> <li>• Microsoft SQL Server Full-Text Search</li> </ul>	
Retail SDK	<p>Visual Studio 2013 Update 3 is required for the Retail SDK in Microsoft Dynamics AX 2012 R3.</p> <p>To use the Modern POS sample code for Windows 8.1 with Visual Studio 2013, you must download <a href="#">TypeScript</a> (<a href="http://go.microsoft.com/fwlink/?LinkId=396427">http://go.microsoft.com/fwlink/?LinkId=396427</a>) for Visual Studio. Version 1.0 or higher is required.</p>	

## Microsoft Dynamics AX

Component	Additional requirements	Notes
Retail online store	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0</li> <li>• ASP.NET 2.0</li> <li>• SharePoint Server 2013 (Enterprise License). <a href="#">Service Pack 1</a> is required with AX 2012 R3 and supported with <a href="#">cumulative update 7</a> for AX 2012 R2.</li> <li>• <a href="#">URL Rewrite Module 2.0</a> (<a href="http://go.microsoft.com/fwlink/?LinkID=277134&amp;clcid=0x409">http://go.microsoft.com/fwlink/?LinkID=277134&amp;clcid=0x409</a>) (64-bit)</li> </ul>	<ul style="list-style-type: none"> <li>• Verify that the SharePoint server(s) that will host the Retail online store meet the following requirements: 16 GB of RAM recommended; 10 GB of RAM and 4 processors, minimum.</li> </ul> <p>For information about hardware and software requirements for SharePoint, see <a href="#">Hardware and software requirements for SharePoint 2013</a> (<a href="http://go.microsoft.com/fwlink/?LinkID=282601">http://go.microsoft.com/fwlink/?LinkID=282601</a>).</p> <p>The following services must be enabled and running in SharePoint Server 2013:</p> <ul style="list-style-type: none"> <li>• Managed metadata service</li> <li>• SharePoint Search service</li> <li>• Search Host Controller service</li> <li>• SharePoint Timer service</li> <li>• SharePoint Administration service</li> </ul>
Retail mass deployment toolkit	Microsoft System Center Configuration Manager 2012 R2	
Retail Server	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0</li> </ul>	
Retail Hardware station	<ul style="list-style-type: none"> <li>• Web server role</li> <li>• IIS 7.0, IIS 7.5, or IIS 8.0</li> </ul>	Retail Hardware station is not supported on the same computer where you have installed Retail online channel.

## 64-bit operating system support

The following table summarizes how Microsoft Dynamics AX components run on 64-bit operating systems.

Component	Runs on a 32-bit operating system	Runs on a 64-bit operating system	Notes
Application Object Server (AOS)	Not recommended	Yes	A 64-bit operating system is required if you must complete a full generation of Common Intermediate Language (CIL), such as in a development environment.
Windows client	Yes	Yes	The Windows client runs in 32-bit mode on 64-bit operating systems.
Office Add-ins	Yes	Yes	
Remote Desktop Services integration	Yes	Yes	
Enterprise Portal and Enterprise Search	No	Yes	
Help Server	No	Yes	
Reporting Services extensions	Not recommended	Yes	The 32-bit version of Reporting Services can be installed on a 64-bit operating system. However, the Microsoft Dynamics AX Reporting Services extensions are not supported in this scenario.
Synchronization service	Yes	Yes	
Synchronization proxy	No	Yes	
Web services on IIS	Yes	Yes	
.NET Business Connector	Yes	Yes	Both the 32-bit and 64-bit versions of .NET Business Connector are installed when you use a 64-bit operating system.

## Microsoft Dynamics AX

Component	Runs on a 32-bit operating system	Runs on a 64-bit operating system	Notes
Debugger	Yes	Yes	
Visual Studio Tools	Yes	Yes	Visual Studio Tools runs in 32-bit mode on 64-bit operating systems.
Retail Headquarters	Yes	Yes	
Retail POS	Yes	Yes	Retail POS runs in 32-bit mode on 64-bit operating systems.
Modern POS	Yes	Yes	
Async Server	No	Yes	
Async Client	Yes	Yes	
Commerce Data Exchange: Synch Service	Yes	Yes	
Commerce Data Exchange: Real-time Service	Yes	Yes	
Retail Channel Configuration Utility (Retail Store Database Utility)	Yes	Yes	
Retail SDK	Yes	Yes	
Retail Server	Yes	Yes	
Retail Hardware station	Yes	Yes	
Retail Online Channel	No	Yes	

**Item 2: Microsoft Dynamics® AX 2012 R3 Summary of Financial Benchmark**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.



## Microsoft Dynamics® AX 2012 R3 Summary of Financial Benchmark

In August 2014, Microsoft conducted a financial benchmark of Microsoft Dynamics AX 2012 R3 to measure the application's performance and scalability characteristics for core financial functionality.

Multiple different workloads were simulated:

- A set of financial transactions was run concurrently.
- A batch of 500 general ledger (GL) journals of 1,000 journal lines each was posted in a separate test.
- A set of management reporter reports and scenarios was executed.
- A year-end closing process was run in a separate test.
- A consolidation process was run in a separate test.

The benchmark was modeled by using two financial periods, previous period and current period. It assumes that the customer is in a closing state for the previous period while entering regular business transactions in the current period. For the closing process (for example, the summary trial balance), some transaction data was created in the previous period before the benchmark run. The defined scenarios were run with 500 concurrent financial users who generated load on the Application Object Server (AOS) instances by using the Microsoft Dynamics AX 2012 R3 Benchmark SDK.

The overall benchmark result shows the capability of Microsoft Dynamics AX and Management Reporter to handle core financial scenarios with volume data while maintaining good performance measures.

This document presents a summary of the benchmark results. For detailed results, see the Microsoft Dynamics AX Retail benchmark for multiple retail workloads (<http://go.microsoft.com/fwlink/?LinkId=521405>).

### ONLINE FINANCIAL TRANSACTION LOAD PROFILE

Module	Scenario name	Percentage	Comment
GL 20.5%	General journal create and post	20%	
	Trial balance – Summary	0.5%	
AP 30.5%	Vendor invoice create and post	22%	Only an invoice is created and posted. The purchase order (PO) has already been created and confirmed.
	Vendor payment journal create and post	8.5%	The payment proposal feature is used.
AR 49%	Sales invoice create and post	30%	Only an invoice is created and posted. The sales order (SO) has already been created and confirmed.
	Free text invoice create and post	7%	
	Customer payment journal create and post	12%	The payment proposal feature is used.

### MANAGEMENT REPORTER LOAD PROFILE

Scenario group	Scenario name	Comment
Integration	Initial integration	
	Periodic integration	1.35M general journal lines were already created, and 1.05M journal lines were also created during periodic integration.
Financial statements	Balance sheet	The default Management Reporter reports are used for financial statements.
	Income statement	
	Detail trial balance report	
	Summary trial balance report	

## OTHER PROCESSES

Process	Description
General ledger journal batch posting	A set of 500 journals with 1,000 lines per journal was posted in a separate test.
Year-end closing	A year-end closing process with general journal data created from the financial and Management Reporter benchmark ran in a separate test
Consolidation process	A consolidation from two subsidiaries to one parent company ran in a separate test.

Note that these are approximate figures – the table describes the basic calculation model. Actual row counts were a little higher in each case.

## RESULTS SUMMARY—ONLINE TRANSACTION PROCESSING

### Throughput measurements

Transaction type	Lines/hour
Ledger journal post	3,377
Purchase order invoice	3,816
Account payable payment journal transfer and post	1,435
Sales order invoice	5,111
Free text invoice post	1,298
Accounts receivable payment journal transfer and post	2,128
<b>Total</b>	<b>13,885</b>

### Response time measurements

Name	Response time (seconds)
Ledger journal post	0.94
Purchase order invoice	4.21
Account payable payment journal transfer and post	1.79
Sales order invoice	2.09
Free text invoice post	2.63
Account receivable payment journal transfer and post	1.33
Trial balance	12

## Utilization summary

Utilization measure	Result
Number of concurrent users	500
Number of AOS instances supporting rich clients	2
Utilization of rich client AOS instances	10.1%
Utilization of database server	29.5%

## RESULTS SUMMARY – BATCH POSTING OF GENERAL JOURNAL ENTRIES

Name	Running time (mm:ss)
500 journals with 1,000 lines per journal	12:29

Aggregation is performed when retail transactions are transferred to sales orders during end-of-day processing.

## RESULTS SUMMARY – MANAGEMENT REPORTER

### Throughput measurements

The initial integration was processed by one task. For the periodic integration scenario, 1.35M journal lines were already created before periodic integration, and another 1.05M journal lines were created during the periodic integration.

There are two periodic integration tasks. Both integrate general ledger transactions. Task 1 integrates pre created records. Task 2 integrates records which are created by the benchmark itself. Each task checks for changes at an interval of 60 seconds.

Scenario	Number of Fact records created	Running time (second = mm:ss)	Number of Fact records created per minute
Initial integration	51,727,954	13,211 (= 220:11)	235,127
Periodic integration (Task 1)	2,131,848	541 (= 9:01)	236,872*
Periodic integration (Task 2)	2,744,000	1,669 (= 27:49)	98,000*

## Response time measurements

The following table shows the running time of financial statements that included 13M Fact records.

Name	Response time (mm:ss)
<b>Balance sheet</b>	3:56
<b>Income statement</b>	1:57
<b>Detail trial balance</b>	9:05
<b>Summary trial balance</b>	22:34*

## RESULTS SUMMARY – OTHER PROCESSES

Name	Number of input journal lines	Running time (hh:mm:ss)
Year-end closing process	5,739,722	1:04:16
Consolidation process	1,961,072 (Subsidiary 1) 1,647,450 (Subsidiary 2)	3:24:38

## HARDWARE LAYOUT AND CONFIGURATION

The benchmark was run on a hardware configuration 2 AOS instances for the online simulation, 1 batch AOS, a Visual Studio controller, and a 10 Visual Studio agents.

### Servers running AOS instances

#### Online AOS instances

- 2-processor, 6-core (12 cores)
- 2.67-gigahertz (GHz) Intel Xeon CPU X5650
- 16 GB of random access memory (RAM)
- 64-bit version of Microsoft Windows Server 2008 R2 Enterprise Edition

#### Batch AOS and Management Reports

- 2-processor, 6-core (12 cores)
- 2.67-GHz Intel Xeon CPU X5650
- 16 GB of RAM
- 64-bit version of Windows Server 2008 R2 Enterprise Edition
- Management Reporter 2.1.10001.101
- Management Reporter task viewer 2.9.0.0

#### Database server

- 4-processor, 4-core (16 cores)
- 2194-megahertz (MHz) AMD Opteron Processor 6174
- 256 GB of RAM
- 64-bit version of Windows Server 2008 R2 Enterprise Edition
- 64-bit version of SQL Server 2012 (Build 11.0.2100.60)

## Disk configuration

- HP logical volume SCSI disk drive
- RAID 10 disk volumes

### Microsoft Dynamics AX database data volume

- 40 physical disks, 15K RPM, 146-GB, SAS, 2.5-inch, RAID 10 (HP DAS)
- 2.67-TB volume
- 510-GB data file

### Microsoft Dynamics AX database transaction log volume

- 4 drives, 15K RPM, 146-GB, SAS, 2.5-inch, RAID 10 (HP DAS)
- 273-GB volume
- 24.3-GB transaction log file

### TempDB database data and transaction log volume

- 6 physical disks, 15K RPM
- 410-GB volume
- 16 × 2-GB data files
- 4-GB transaction log file

## Visual Studio

- 64-bit version of Windows Server 2008 R2 Enterprise Edition
- 64-bit version of Visual Studio 2010 Ultimate

## Controller

- 2-processor, 6-core (12 cores)
- 2.67-GHz Intel Xeon CPU X5650
- 16 GB of RAM
- 64-bit version of Windows Server 2008 R2 Enterprise Edition

## Agents

### Two agents

- 2-processor, 4-core (8 cores)
- 2.13-GHz Intel Xeon CPU L5630
- 16 GB of RAM
- 64-bit version of Windows Server 2008 R2 Enterprise Edition

### Four agents

- 2-processor, 6-core (12 cores)
- 2.67-GHz Intel Xeon CPU X5650
- 16 GB of RAM
- 64-bit version of Windows Server 2008 R2 Enterprise Edition

### Two agents

- 1-processor, 2-core
- 2.60-GHz Intel Xeon CPU E5-4650L
- 8 GB of RAM

- 64-bit version of Microsoft Windows Server 2012 Datacenter

## Two agents

- 1-processor, 8-core
- 2.60-GHz Intel Xeon CPU E5-4650L
- 16 GB of RAM
- 64-bit version of Windows Server 2012 Datacenter

## DISCLAIMER

These benchmark results were measured in a controlled lab environment, without other applications running. The response times reflect only server response time: they do not include the rendering time on the client. The benchmark was executed on optimized hardware, using the Microsoft Dynamics AX 2012 R2 SYS layer without reporting activity during execution. Sample code included in this report is made available AS IS.

Performance tests and ratings are measured using the computer systems and components specified in this report (e.g., non-customized version of Microsoft Dynamics AX 2012 R2, transaction mix, data composition, and indexes) and reflect the approximate performance of Microsoft Dynamics AX 2012 R2 as measured by those tests. Any difference in system hardware, software design or configuration, customizations, transaction mix, data composition, or indexes may affect actual performance. The transaction mix and data composition affect sizing and hardware requirements.

Inherently, Microsoft believes that the Microsoft Dynamics AX 2012 R2 stack and application are built to scale, and changes to the code base must go through localized performance testing. Customers or partners should consult other sources of information to evaluate the performance of systems or components they are considering purchasing.

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**Item 3: CMC Software Development Process Overview**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.



# CMC SOFTWARE DEVELOPMENT PROCESS

Scrum Background and  
Process Implementation at  
Campus Management

SEPG Team

Revision: 30 April 2015

# CMC Software development process

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# CMC Software development process

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## Contents

What is Scrum?.....	4
Scrum in 10 Easy Steps.....	4
Scrum Ceremonies.....	5
Additional Scrum Ceremonies at Campus Management .....	6
Scrum at Campus Management .....	7
Campus Management Product Release Lifecycle - Overview .....	7
Product Release Funnel.....	8
Campus Management Product Release Lifecycle – Step-Wise .....	9
Feature, Product Backlog & Bug - State (Status) Flows.....	13
Scrum Concepts & Terms .....	14
Twelve Points of the Scrum Framework.....	14
Key Roles in Scrum.....	15
What is RACI+F?.....	16
Typical Quality Attributes .....	17
RACI+F Overview & Activities .....	18
Scrum Roles – Pigs vs. Chickens.....	19
Pigs Roles – Product Owner, Scrum Master and Scrum Team .....	20
Sprints.....	21
Daily Scrum or Stand-up .....	21
Scrum of Scrums .....	22
Tooling (Team Foundation Server – TFS).....	23
Define and track work .....	23
Additional Scrum Artifacts via TFS.....	25
Increment .....	25
Burndown .....	25
Additional References .....	26

# CMC Software development process

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## What is Scrum?

“Scrum is a way for teams to work together to develop a product. Development, using Scrum, occurs in small increments, with each increment building upon previously created pieces from prior increments. Building products one small piece (increment) at a time encourages creativity and enables teams to respond to feedback and change, to build exactly and only what is needed.”

Before this document goes too far, it is important to understand that it starts out at a high level and quickly begins to provide much more detail into what is done here at Campus Management. After that, this guide will continue with the concepts and the tooling that will be used to manage Scrum. Stated differently, this information is being presented a little out of order as it is assuming everyone reading it is already at Campus and what is needed are the basics.

## Scrum in 10 Easy Steps

At a high-level the 10 basic steps are:

1. Plan Release requirements (Release Kickoff)
2. Get your backlog in order (Backlog Management & Refinement – i.e. understanding the feature requirements)
3. Estimate your product backlog (Planning Poker)
4. Plan Sprint tasks (Sprint Planning)
5. Create a collaborative workspace (Get the Team and Board setup)
6. 'Sprint' to achieve the Sprint goal(s) (Complete the Delivery of Features (or sub Features) and Bugs)
7. Stand up and be counted (Stand-up meetings)
8. Track progress with a daily burn-down chart
9. Finish on schedule!
10. Review, reflect & repeat process (Sprint Review & Retrospective)

Another way to look at or understand Scrum is to watch the following video -

<http://www.youtube.com/watch?v=XU0IIrItyFM>

# CMC Software development process

## Scrum Ceremonies

Before we get into the actual process, you should also understand the standard Scrum Ceremonies. At a high-level, the Scrum Ceremonies are as follows. The typical attendees as well as a related agenda and the suggested frequency / duration have been documented.

Ceremony	Members *	Agenda What is to be done by the whole team	Frequency/Duration
<b>Release Kickoff</b>	<b>Product Owner</b> Scrum Master Delivery Team	What is this Release About? Why are we doing it? Why is it important?	Prior to the release being scheduled – 2-4 weeks in advance. Less than 1 hour.
<b>Backlog Management</b>	<b>Product Owner</b> Scrum Master	Prioritize PBIs and Bugs	As needed - ongoing.  Minimum goal should be to have at least 2 full Sprints of work understood and ready for the team to deliver. Ideally a whole release’s Backlog should be prioritized.
<b>Refinement (Grooming)</b>	Product Owner <b>Scrum Master</b> Delivery Team	Assign Effort (days) via Planning Poker** Where possible break down large effort PBIs (> 10) into child PBIs for those easily understood and can be broken down easily.  Goal is to get a PBI or Bug to the <b>Approved</b> state in TFS with the <b>Effort</b> being defined.	1-2 hours (up to 10% of delivery team’s time) weekly. More if the refined backlog falls below 2 Sprints worth of work.  Goal is to have at least 2 Sprints of PBIs and/or Bugs at the <b>Approved</b> state.
<b>Sprint Planning/Kickoff</b>	Product Owner <b>Scrum Master</b> Delivery Team	Capacity Planning <b>Commit</b> to PBIs in priority order Break committed PBIs into tasks (hours)	Every 2 weeks. Pre Sprint or 1st day of Sprint. 2-4 hours. 1 <sup>st</sup> day of the Sprint. Goal is to also have all the <b>Tasks</b> related to the <b>Committed</b> PBIs or Bugs defined.
<b>Daily Stand-up</b>	<b>Scrum Master</b> Delivery Team Product Owner	What did you do yesterday? What will you do today? What are your impediments?	Daily - 15 – 30 minutes. Update the history in all Tasks reviewed. Ensure all Hours (Remaining) have been (or are) updated.
<b>Sprint Review and Retrospective</b>	Product Owner <b>Scrum Master</b> Delivery Team	What we did well? What we need to improve? Demo completed PBIs that have not been demoed	Every 2 weeks, i.e. post a Sprint 2-4 hours Demos can be held as work is completed

\* The name in **Bold/Red** is the facilitator for the ceremony. Note **Release Kickoff** and **Backlog Refinement** may occur in either order – i.e. one may happen before the other or vice versa.

\*\* For reference information about Planning Poker, see:

<https://team.campusgmt.com/SEPG/Agile%20Documentation/Planning%20Poker.docx>

# CMC Software development process

## Additional Scrum Ceremonies at Campus Management

The below are additional CMC ceremonies defined to drive the improvement in overall quality of a release. Demos are very typical in Scrum while Release Readiness and Go / No Go ceremonies are not:

Ceremony	Members *	Agenda	Frequency/Duration
<b>PBI or Bug Demo</b>	Anyone who is interested in the Work Item	PO or PO have to Approve the Work Product as demonstrated. Only then can a Work Item be changed to <b>Done</b> .	As need
<b>Release Readiness (RR)</b>	Product Owner <b>Scrum Master</b>	Review of all PBIs and Bugs included in a release as well as the status of all QA.  Templates for the RR PPT and the RR Checklist are available on the SEPG site**.	<b>Time boxed - 30 mins. or less.</b> Assess status of the release including all code, testing, documentation, bug resolution, packaging and training. Examples: <ul style="list-style-type: none"> <li>• <b>for a release that was 4-6 weeks</b> in duration there should be a minimum of 3 meetings prior to the Go / No Go</li> <li>• <b>for a release that was 6-8 weeks</b> in duration there should be at least 1 week of daily meetings prior to the Go / No Go</li> <li>• <b>for a release greater than 2-3 months</b> in duration there should be at least 2 weeks of daily meetings prior to the Go / No Go</li> </ul>
<b>Go / No Go</b>	Product Owner <b>Scrum Master</b> Client Services Professional Svcs Hosting SEPG VP Development	Approve a release for distribution	As needed.  Note: It is essential that this meeting have its own Task in TFS, in order to facilitate SSAE16 Audit. The Task must document the outcome of the meeting (Go or No Go).

\* The name in **Bold/Red** is the facilitator for the ceremony.

\*\* For reference, see:

<https://team.campusgmt.com/SEPG/Agile%20Documentation/Go-No%20Go%20Readiness%20Review%20Guidelines.docx> ;

see also:

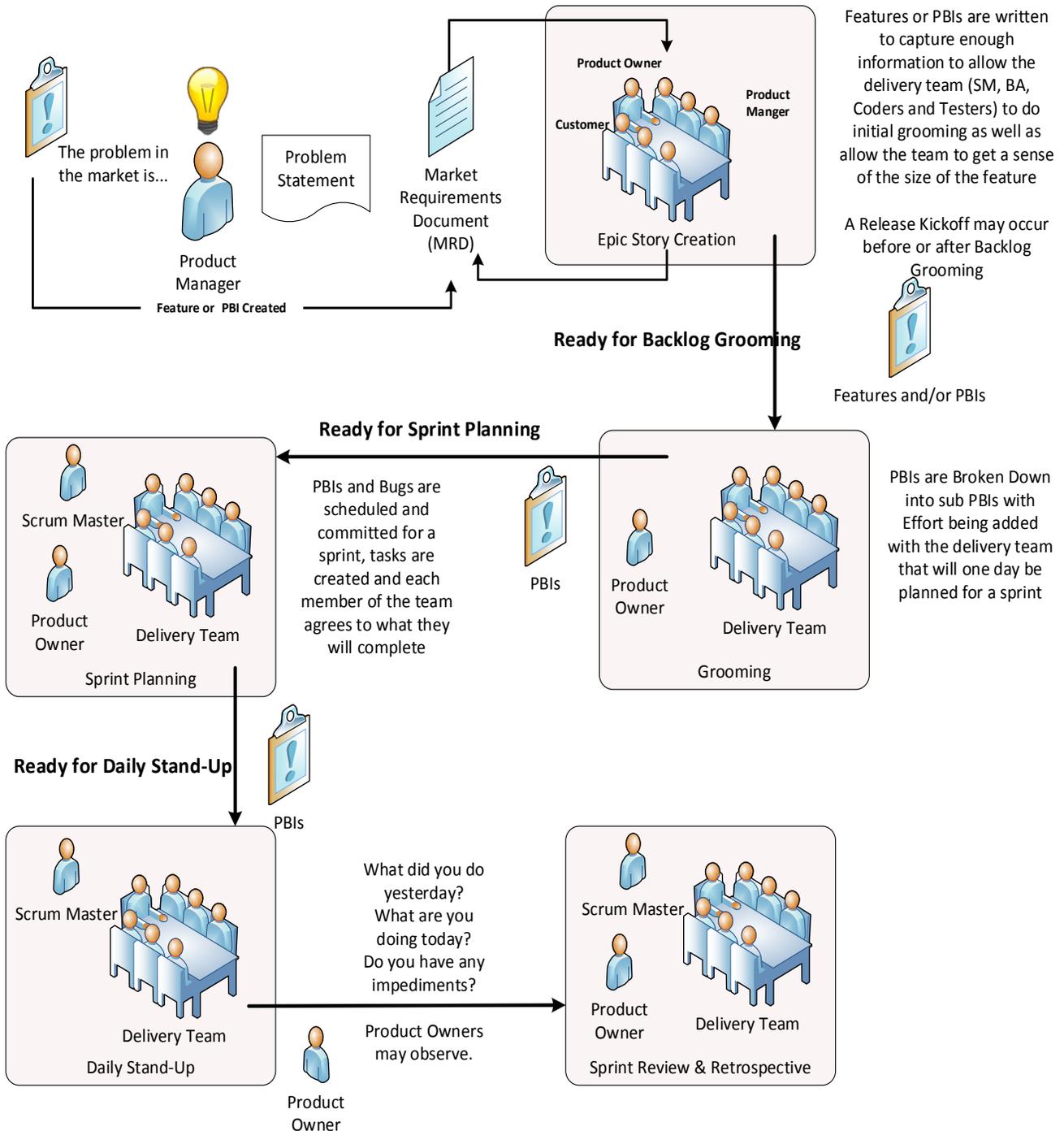
<https://team.campusgmt.com/SEPG/Agile%20Documentation/Release%20Readiness%20Template%20Slide%20Deck.pptx>

# CMC Software development process

## Scrum at Campus Management

### Campus Management Product Release Lifecycle - Overview

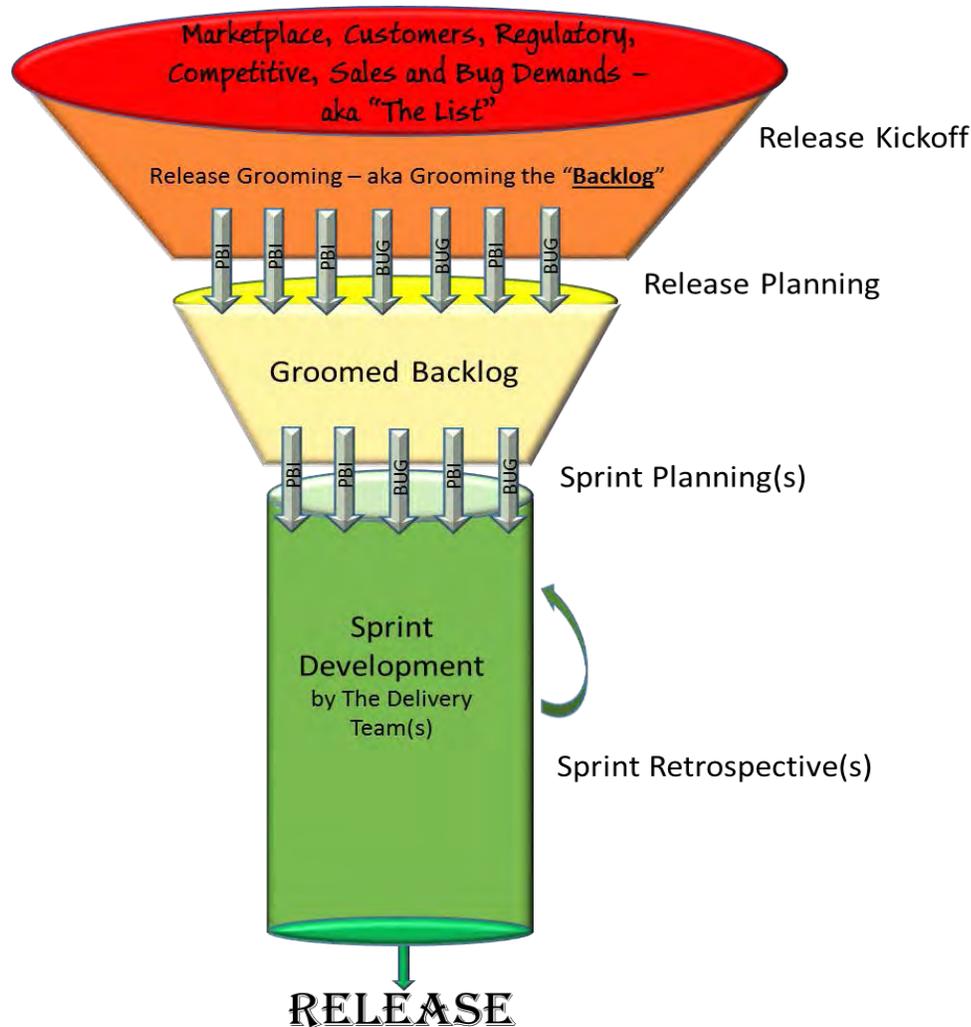
At Campus Management a Release (and its related Sprints) will broadly follow the steps outlined below:



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## Product Release Funnel

Another way of thinking about Scrum and the process of getting a product release done is the classic product requirements funnel with the Scrum Ceremonies identified at each inflection point.



The red to green coloring connotation is on purpose. When the Product Management (PM) organization is collecting all the Marketplace, Customer, etc. items they are effectively dealing with orchestrated chaos. It is red as PM sorts through all the inputs to assess what needs to be in a release. As the progression on any requirement moves through the following stages:

1. **Idea/Thought/Request/Issue** - we are thinking about a release but we need to understand what to include
2. **Release Kickoff** - we know we are going to have a release and let me tell you what it's about
3. **Release Planning** - we are pretty sure we know what is in the release and we've done preliminary prioritization of the list of things to include
4. **Sprint Planning** - so the release contents have been broken into pieces and we are going to do some of the pieces in this Sprint

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## Campus Management Product Release Lifecycle – Step-Wise

At Campus Management a Release (and its related Sprints) will broadly follow the steps outlined below. These same major milestones can be found in the Life of a Release Swim Lanes chart.

### 1) Release Kickoff:

- a) Typically this is held by the Product Owners (PO) team themselves although they may or may not include any Delivery Teams (DT) members as information reference points. It is strongly suggested that the DT be included.

### 2) Backlog Management (Priority management) sessions:

- a) Iterative meetings primarily managed/held by **Products Owners**. The steps are:
  - i) Prioritization of all Work Items (Features, PBIs and Bugs).
  - ii) New Features and/or PBIs are created for the release.
    - (1) These should be very detailed in defining **What** is needed and **Why**, not **How**.
  - iii) Existing Features/PBIs in the backlog are evaluated and included for the release, as needed.
  - iv) Once any Features/PBIs are prioritized by the PO team, Business Analysts (BAs) may be engaged to do a high level review of any artifacts. Basically this is an artifact assessment / inventory effort.
    - (1) Features/PBIs that do not have complete enough information are sent back to the PO team to address any issues identified.
- b) **Scrum Masters** may participate in these based on information needed by the PO.
- c) Other activities that may or may not be done in these sessions include:
  - i) BETA strategy
  - ii) Launch plans
  - iii) Customer commitment reviews
- d) Note:
  - i) At this point no dates will be committed, although should any date commitments be needed, these will be reviewed carefully by PO and Scrum Masters.
    - (1) Both the PBI and Bug have fields defined to track any date commitments.

### 3) Refinement:

- a) Once the Features, PBIs and/or Bugs have been prioritized, the PO and DT have the goal to get the Work Items into an **Approved** state so they can be consumed by the Delivery Team (DT). Stated differently a DT only takes on work from the backlog that is in **Approved** state. The same process applies to both PBIs and Bugs. Features themselves are not Approved – the PBIs and Bugs related / associated are Approved. Once a PBI or Bug related to a Feature is started, the Feature is set to In Progress. .
  - i) Suggested Time Box is 1-2 hours weekly
    - (1) There may need to be more meetings if the backlog is not kept at sufficient depth to provide a DT 2 Sprints worth of backlog.
- b) Includes:
  - i) PO
  - ii) DT members needed for any given artifact
- c) Artifact Inputs:
  - i) PBIs and/or Bugs
    - (1) Any related PO artifacts (e.g., Enterprise Architect artifacts) should be connected to PBIs and/or Bugs – **not** Features
  - ii) Release timeline requested from PO
  - iii) Bullet list of drivers (this information should be clearly documented in the Features, PBIs and/or Bugs):

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- (1) Why is this release important?
  - (2) What competitive or market drivers are pushing this release?
  - (3) What customer commitments may be included and why?
  - (4) What product problems are being solved?
- iv) Date drivers/commitments
- d) Artifact Outputs:
- i) PBI or Bug commitments (getting the state to **Committed**) – as defined/prioritized by the PBI **Business Value** field field\*\*. The values are:
    - (1) = **Must Have**. These **should never be deferred** from a release.
    - (2) = **Should Have**. These **may be deferred** from release without impact to the overall quality of the release but ideally, they should not be. A Should Have should not be escalated to a Must Have just because a PO expected the Should Have to be included in a release.
    - (3) = **Nice to Have**. These are, as indicated, nice to have items and they should be the first items deferred (removed from the release and placed in the general backlog) should a release need to be descoped.
- \*\*For more information regarding TFS Work Item Management see:  
[https://team.campusmgmt.com/SEPG/Agile%20Documentation/TFS%20Work%20Item%20Type%20\(WIT\)%20Management%20Guidelines.docx](https://team.campusmgmt.com/SEPG/Agile%20Documentation/TFS%20Work%20Item%20Type%20(WIT)%20Management%20Guidelines.docx)
- Note:**
- o The PBI **Business Value** equates to the Bug **Severity** - both use a 1 – 4 scale.
  - o The PO, when Refinement, should always refine each sprint AND release to have a mix of 1 – 3's. Why 3's?:
    - Level 3 items should typically be smaller in scope and/or potentially deferrable
    - Level 3 items should be valuable enough to rank as level 2 items but are also candidates for deferring
  - o Only a PO can make the final determination of these priorities. They can request anyone's assistance to do so BUT the PO OWNS the backlog as well as accountability and ownership to steward the completion of the items with the assistance of the Scrum Master. Missed or incomplete requirements are the sole responsibility of the PO to identify and resolve.
  - o Refinement is a balance between the team's capability versus the needs of the release and/or sprint versus the timeline pressures versus business value
- ii) Target timeline for the release – as needed by PO.
- (1) Releases can be time based or feature based. Generally the behaviors of the two are:
    - **Time based** should be risk adverse so that less is committed to in order to assure a successful delivery against the deadline.
    - **Feature based** should assume more risk as there are less deadline pressures and greater feature demands.
- iii) Initial assessment by the Delivery Team(s) on what can be completed and by when.
- (1) Typically this is no closer than a calendar quarter commitment although in some regulatory and/or smaller releases (small number of simple PBIs) this may be a calendar month commitment.
- iv) Broad assessment of framework dependencies – if any.
- v) Planned dates for Release Readiness meetings. For release cycles that are relatively short (e.g., 4 – 6 weeks), there should be at least three Release Readiness meetings prior to the Go / No Go Release Readiness meeting. For longer cycles, Release Readiness meetings should start at least two weeks

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prior to the Go / No Go meeting, they should be held every other day during the penultimate week and daily the last week.

- (1) Participants are the same as described in the “Go / No Go Readiness Review Agenda” document available at the SEPG SharePoint site.
- (2) Purpose is to give stakeholders an opportunity to ask questions and voice concerns with the goal of ensuring the Go / No Go meeting will be quick and positive.

## 4) Sprint Planning/Kickoff

- a) This meeting should typically be 2-4 hours.
  - i) It is held iteratively **before** each Sprint to be completed in a release.
- b) Includes:
  - i) PO
  - ii) Delivery Team
- c) Artifacts Input:
  - i) Prioritized list of PBIs and/or Bugs (only items in **Approved** state are candidates for a Sprint) are taken from the top of the backlog and **Committed** for delivery in the Sprint.
  - ii) Capacity / Resource management planning – Delivery Team
  - iii) Sprint Planning
    - (1) Includes any framework or tooling dependencies prioritized ahead of feature commitments that have these dependencies.
- d) Artifact Output:
  - i) TFS Release Timeline – this is not a release commitment.
  - ii) Sprint Composition – teams and timelines

## 5) Sprints (includes Design, Coding, Testing, Documentation, Demo(s) Release Review & Audit, potentially releasable code/product) :

- a) At Campus Management the life of a release will typically follow (in this example we will use a release that is made up of **4 sprints**):
  - i) **Sprint 0** – aka initial Sprint Refinement
    - (1) 1 – 2 weeks.
      - Ideally, this should only be 1 week if the Release Development Kickoff and Artifacts (PBIs) are well documented and approved by all parties.
    - (2) Enabling, planning, Refinement, artifact preparedness/validation
    - (3) Initial assessment of effort – Level of Effort (LoE) for all PBIs that are Business Value 1 (Must Have), 2 (Should Have) and Bugs that are Severity 1 or 2.
      - Includes validating whether the date commitment (if one exists) is viable and/or defining an initial date assessment of the release completion.
      - When discussing each effort estimate, the Delivery Team should explicitly consider whether or not the estimate is sufficient to avoid accrual of Technical Debt.
      - Use Planning Poker for each item that is anticipated to be in the release – i.e. PBIs with a Business Value of 1 or 2 and Bugs with a Severity of 1 or 2.
    - (4) Finalization of any artifacts for Sprint 1.
  - ii) **Sprint 1**
    - (1) 2 weeks
    - (2) Delivery team (Developers, Testers, Documentation & SCM) of Sprint 0 artifacts
    - (3) PO support for Sprint 1 and development of artifacts for Sprint 2
    - (4) Demo to stakeholders of all Committed Deliverables
  - iii) **Sprint 2**
    - (1) 2 weeks
    - (2) Delivery Team of Sprint 1 artifacts

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- (3) PO support for Sprint 2 and review / development of Test Cases. Also review of Doc artifacts
- (4) Demo to stakeholders of all Committed Deliverables
- iv) **Sprint 3 – Closing Sprint.**
  - (1) Facilitated by the Scrum Master in conjunction with the PO.
    - Any missed deliverables will drive new PBI which will be placed in the Backlog for future Refinement
  - (2) 2-3 weeks
  - (3) Includes any Business reviews, Feature reviews and demos – as applicable
  - (4) Impact on prior releases – i.e. what may be EOL'd (EOL = End-of-Life.)
  - (5) Classic release process with full Test Case Burndown and install/upgrade scenarios
  - (6) Other than bugs no code churn should be done in this Sprint
  - (7) Artifact Input:
    - The release material – code, release notes, test cases, documentation, database scripts and any schema changes, on-line help, installation materials (install or upgrade guides) and the install package
  - (8) Artifact Output:
    - Release Readiness and Bug Burn down
- v) It is acceptable in longer releases (>5 sprints) to:
  - (1) Add a week long Refinement Sprint if the Approved backlog falls below 2 sprints worth of backlog
  - (2) Add a regression sprint to assure the work completed is of release quality
- b) **At the end of a Sprint and / or Release:**
  - i) **Sprint Retrospective (after every Sprint):**
    - (1) Typically 2-4 hour time limit
    - (2) Facilitated by the Scrum Master
    - (3) All team members reflect on the past sprint
    - (4) Make continuous process improvements
    - (5) Three main questions are asked in the sprint retrospective:
      - What went well during the sprint?
      - What did not go well during the sprint?
      - What could be improved in the next sprint?
  - ii) **Release Review Meeting (This should be done at the end of a release):**
    - (1) Typically a 4 hour time limit
    - (2) Review the work that was completed and not completed
    - (3) Present the completed work to the stakeholders (a.k.a. "the demo")
      - This will likely be done throughout the Release and this demo will be done to share the release content with other organizations.

At Campus Management, the sprint 0 and the expanded sprint 3 (as outlined above) are known as Scrum Buts or Scrum Ands - <http://kenschwaber.wordpress.com/2012/04/05/Scrum-but-replaced-by-Scrum-and/>.

These exist due to the existing team maturity related to Scrum and based on the PO model implemented at Campus – i.e. Campus depends heavily on the BAs for not only new design documents but also any maintenance issues that arise.

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## Feature, Product Backlog & Bug - State (Status) Flows

The below are standard State changes for Scrum work items:

State Changes	When to Use
<b>From</b> New <b>to</b> Approved	When the delivery team (Scrum Master) approves the item for the Product backlog (PBI) or Bug. This is typically done with the Scrum team. <b>Ideally</b> the Feature, PBI (or Bug) has a useful / valuable description (or steps to reproduce from a Bug perspective), Acceptance Criteria that are understood by the whole team AND there is a Level of Effort (LoE) documented. It may be acceptable to Approve a PBI (or Bug) without this information but it then puts the PBI (or Bug) <b>at risk</b> of being incorrectly included in a given/targeted Release. The Effort (related to PBIs) should also be added to the PBI before the PBI is Approved.
<b>From</b> New <b>to</b> Removed	When the product owner decides that the team does not need to implement the backlog item.
<b>From</b> Approved <b>to</b> Committed	When the team has committed to implementing the backlog item in the current sprint.
<b>From</b> Approved <b>to</b> Removed	When the team will not implement the backlog item because product requirements or other work conditions have changed.
<b>From</b> Removed <b>to</b> New	When the team reconsiders the backlog item.
<b>From</b> Committed <b>to</b> Done	When the team has completed the backlog item and has fulfilled its acceptance criteria.
<b>From</b> Done <b>to</b> Committed	When the team has found additional work that the backlog item requires to be completed.
<b>From</b> Committed <b>to</b> Approved	When the work for the backlog item has stopped because of staff changes or priority adjustment.

## Scrum Concepts & Terms

### Twelve Points of the Scrum Framework

The genius of Scrum is the simplicity of the Framework that it provides.

#### **Three Roles**

- (1) Scrum Product Owner (PO)
- (2) Scrum Master (SM)
- (3) Delivery Team Member (DT) – BA, Developer, Tester, Documentation & SCM (Software Configuration Management)

#### **Three Ceremonies**

- (4) Sprint Planning Meetings
- (5) Daily 15-Minute Stand-Up Meetings
- (6) Sprint Review / Retrospective

#### **Three Artifacts**

- (7) The Product Backlog
- (8) The Sprint Backlog
- (9) The Burndown Chart

#### **Three Best Practices**

- (10) User Stories
- (11) Planning Poker
- (12) Physical Information Radiators – *CMC is not currently doing this*

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## Key Roles in Scrum

Building complex products for customers is an inherently difficult task. Scrum provides structure to allow teams to deal with that difficulty. However, the fundamental process is incredibly simple, and at its core, is governed by three primary roles.

- **Product Owners** determine what needs to be built. POs **own all aspects of the features being built and the bugs being resolved** – from requirements and acceptance criteria, to validating the delivered item is complete and accurate.
- **Delivery Teams** build what is needed in small increments (typically 1 – 3 week increments) and then demonstrate what they have built. Based on this demonstration, the Product Owner determines what to build next. Note that Scrum does not specifically include any given role – it does specifically cite that whatever resource is needed should be part of the team.
- **Scrum Masters** ensure this process happens as smoothly as possible, and continually help improve the process, the team and the product being created.

While this is an incredibly simplified view of how Scrum works, it captures the essence of this highly productive approach for team collaboration and product development.

At Campus Management, depending on the team structure and size of the Delivery Team, the development manager may or may not play the part of a Scrum Master. The **ancillary roles** in Scrum teams are those with no formal role and infrequent involvement in the Scrum process—but nonetheless, they must be taken into account.

- **Stakeholders** are the customers, vendors or other individuals within an organization. They are people who enable the project and for whom the project produces the agreed-upon benefit[s] that justify its production. They are only directly involved in the process during the Sprint reviews.
- **Managers** (Product or Development) are the people who control the work environment and facilitate removing impediments.

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## What is RACI & F?

The Scrum Alliance outlines **RACI & F** as a simple document that describes roles and responsibilities for the functional manager (FM), Scrum Master (SM), product owner (PO) and the Scrum team. However a matrix about roles & responsibilities is not always enough. The Scrum Alliance wanted to outline clear accountability. Hence the RACI matrix is favored as a concise way to clearly state who is uniquely accountable for what. Basically RACI stands for:

- **R** – Responsible
- **A** – Accountable
- **C** – Consulted
- **I** – Informed

But the Scrum Alliance added a twist to the RACI matrix because they wanted to highlight the fact that for some activities, facilitating/coaching is also a key role. Hence they created an augmented matrix known as RACI+F. In addition, in the Agile spirit of "individuals and interactions over process and tools," they thought that it would be important for everyone to understand why it was created. So

- **F** - Facilitate

Primarily the development of the RACI+F document was driven in order to provide clear ownership/accountability for the different roles in Scrum as well as to highlight some key aspects of Scrum – succinctly:

- Functional
- Non-Functional

requirements and how they are addressed.

In a product a **non-functional** requirement is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors. In contrast functional requirements define specific behavior or functions. The plan for implementing functional requirements is detailed in the system design. The plan for implementing non-functional requirements is detailed in the system architecture.

Broadly, **functional requirements** define **what** a system is supposed to do and **non-functional requirements** define **how** a system is supposed to be or behave. **Functional requirements** are usually in the form of "**system shall do <requirement>**", an individual action of part of the system, perhaps explicitly in the sense of a mathematical function, a black box description input, output, process and control functional model or IPO Model. In contrast, **non-functional requirements** are in the form of "**system shall be <requirement>**", an overall property of the system as a whole or of a particular aspect and not a specific function. The systems' overall properties commonly mark the difference between whether the development project has succeeded or failed.

**Non-functional** requirements are often called **qualities of a system, quality attributes or Quality of Service**. Other terms for non-functional requirements are "constraints", "quality attributes", "quality goals", "quality of

# CMC Software development process

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service requirements" and "non-behavioral requirements". Informally these are sometimes called the "ilities", from attributes like usability, reliability, extensibility, installability, stability, scalability, maintainability, and portability.

## Typical Quality Attributes

Qualities (or Quality Attributes), that are non-functional requirements, can be divided into two main categories:

- 1) Execution qualities, such as security and usability, which are observable at run time.
- 2) Evolution qualities, such as testability, maintainability, extensibility and scalability, which are embodied in the static structure of the software product.

The following link provides additional information about a popular model of quality attributes known as FURPS - <http://en.wikipedia.org/wiki/FURPS>

The complete list of product Quality Attributes are:

- 1) **Accessibility** – platform
- 2) **Availability** - does it work when needed and is the functionality reliable (reliability)
- 3) **Capacity** – ability to manage scalability without necessarily requiring additional hardware. When additional hardware is required the Capacity modeling should dictate what is required.
- 4) **Data Integrity** - does it support standard transaction processing rules
- 5) **Environmental** - does it support standard environments and, with any special requirements, are these requirements achievable/acceptable
- 6) **Interoperability** - support for APIs and standard interface techniques
- 7) **Maintainability** - how effective is the code written, how easy is it to maintain, how well does it adhere to any coding standards, how quickly can defects be identified (correctly) and remediated
- 8) **Manageability** - can it be effectively managed by standard techniques and tools
- 9) **Performance** – for example Response Time, Throughput, Utilization, Static Volumetric
- 10) **Recoverability** - whenever a failure does occur does it roll back transaction data or provide a easily identifiable recovery point
- 11) **Regulatory** - when applicable how well does it support any regulatory requirements
- 12) **Reliability** - does the product simply work as prescribed and as expected based on the functionality delivered
- 13) **Scalability** - how many users and at what response time and throughput
- 14) **Security** - types, levels and completeness
- 15) **Serviceability** - logging, diagnostics
- 16) **Usability** - from the basics of keyboard strokes and mouse clicks, to complex navigation and intuitive layout/icons/help

# CMC Software development process

## RACI & F Overview & Activities

The below is the RACI & F Activities specifically called out at Campus Management as well as the individual roles each individual will play in those activities.

RACI & F Activities (Responsible, Accountable, Consulted, Informed & Facilitate)	Chickens		Pigs		
	Functional Manager (FM)	Product Manager (PM)	Product Owner (PO)	Scrum Master (SM)	Scrum Team
Define Features for Product (including initial Acceptance Criteria)	F/C	R/A	F/C	I	I
Provide Vision and Goals for the Product <sup>1</sup>	C	R/A	I/C	I	I
Prioritize and Manage the Product Backlog <sup>2</sup>	F	C/F	R/A	F	C/I
Manage the Release Train <ul style="list-style-type: none"> <li>Release Planning against Roadmap (Release Target Date &amp; Goals)</li> <li>Manage Technical Debt</li> </ul>	F	C/I	R/A	I	F
Ensure Consistency of Scrum practices across teams	R/A	I	F	I	I
Define Functional Acceptance Criteria	I	F	R/A	F	F
Write Functional Acceptance Tests	I	C	F	F	R/A
Define Non-Functional Acceptance Criteria	I	C	R/A	F	F
Write Non-Functional Acceptance Tests	I	C	F	F	R/A
Approve Product Backlog Items (PBIs) are ready for Delivery	F	F	R/A	F	C/I
Provide Resources with the right skills and mind-set	R/A	I	I	F	C/I
Remove Impediments	F	F	F	R/A	F
Make sure Scrum practices are used and improved within the Team <ul style="list-style-type: none"> <li>Release Planning</li> <li>Sprint Planning</li> <li>Sprint Management (burn down &amp; resources)</li> <li>Retrospective</li> </ul>	R	F	C	R/A	R
Report team status against the sprint	I	I	R	A	F
Create, apply and continuously improve the Definition of Done (DoD)	C	F	R/A	F	R
Report team(s) status against the release	R/A	F	F	F	F
Ensure Quality of Product <ul style="list-style-type: none"> <li>Product is successful in the market (adoption rate and stability) and deemed valuable by the customer</li> <li>Did the features/PBIs get completed and did they pass any Acceptance tests</li> <li>Did all code pass defined code reviews and unit tests</li> </ul>	R	R	R/A	R	R
Manage Risks <ul style="list-style-type: none"> <li>Requirements changes or gaps</li> <li>Market changes</li> <li>Resource challenges</li> <li>Technology challenges</li> </ul>	F	I	R/A	F	C/I
Provide Governance for Development process guidance artifacts	R/A	F	F	F	F

<sup>1</sup> The transition from PM to PO occurs between these two activities.

<sup>2</sup> The priority order not only accounts for PM demand but technical debt and predecessor / successor management which may not allow all deliverables to be in the exact PM order. PM is consulted on Bugs but the PO is responsible for managing the bugs against the overall priority of deliverables.

## Scrum Roles – Pigs vs. Chickens

### Scrum Roles

#### Pigs

**Who?**

Product owner  
Scrum master (or facilitator)  
Scrum team (or project team)

**Committed to:**

- the project and the scrum process
- building software regularly and frequently
- they have 'their bacon on the line'

#### Chickens

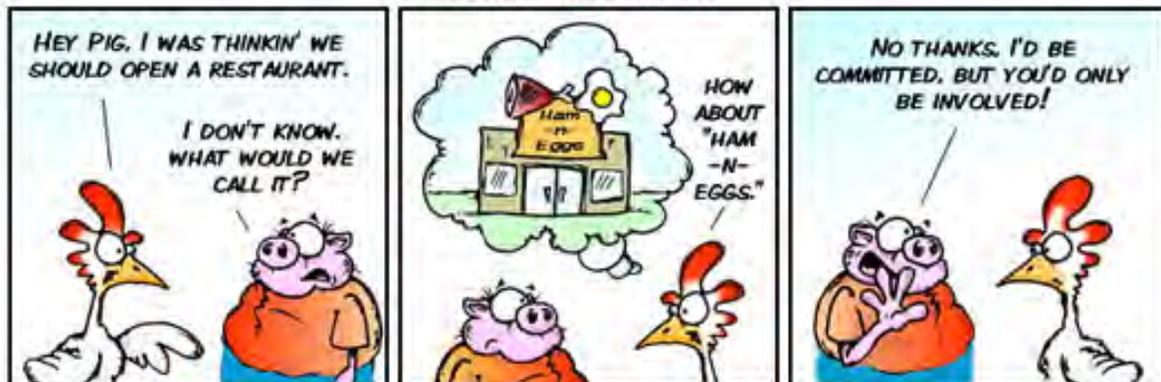
**Who?**

Users  
Stakeholders  
Consulting experts

Everyone else who is **involved, engaged and interested** in the project

Are **not part of the Scrum process**. Their ideas, desires and needs are taken into account, but are not in any way affecting or distorting the Scrum project.

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## Pigs Roles – Product Owner, Scrum Master and Scrum Team



### Pigs and Roles

#### Product Owner

- Defines the features of the Product and its acceptance criteria ("Definition of Done")
- Is responsible for the value inherent in each Product (ROI).
- Prioritises and ranks Products according to their value.
- Can change Products and ranking every Sprint.
- Accepts or rejects work results.

#### Scrum Master

- Removes barriers to the team delivering the Products they've committed to at Sprint Planning.
- Enables close cooperation across all roles and functions and removes barriers.
- Facilitates meetings.
- Ensures that the process is followed.

#### Scrum Team

- Cross-functional with 7 +/- 2 members
- Has the responsibility to do everything within the boundaries of the project guidelines to reach the Sprint's goal.
- Organises itself, tasks and work.
- Demos work to the Product Owner at the end of the Sprint.



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## Sprints

A Sprint is the basic unit of development in Scrum. The Sprint is a "[time-boxed](#)" effort, i.e. it is restricted to a specific duration. The duration is fixed in advance for each Sprint and is normally between one week and one month.

At Campus Management we are currently defaulting to 2 week Sprints but it is perfectly reasonable to have a project where the Sprints vary in duration although:

- These should be defined at the start of the project
- The team is strongly encouraged to define a standard duration and adhere to it for the life of the release

Each Sprint is preceded by a planning meeting, where the tasks for the Sprint are identified and an estimated commitment for the Sprint goal is made, and followed by a review or retrospective meeting, where the progress is reviewed and lessons for the next Sprint are identified.

During each Sprint, the team creates finished portions of a product. The set of features that go into a Sprint come from the product *backlog*, which is an ordered list of [requirements](#). Which backlog items go into the Sprint (the Sprint goals) is determined during the Sprint planning meeting. During this meeting, the Product Owner informs the team of the items in the product backlog that he or she wants completed (the ones with the highest priority). The team then determines how much of this they can commit to complete during the next Sprint, and records this in the Sprint backlog. The Sprint backlog is property of the Delivery Team, i.e. during a Sprint; no one is allowed to edit the Sprint backlog except for the Delivery Team.

The Sprint goals should not be changed during the Sprint. Development is [time-boxed](#) such that the Sprint must end on time; if requirements are not completed for any reason, they are left out and returned to the product backlog. After a Sprint is completed, the team demonstrates how to use the software.

Scrum enables the creation of self-organizing teams by encouraging co-location of all team members, and verbal communication between all team members and disciplines in the project.

A key principle of Scrum is its recognition that during a project, the customers can change their minds about what they want and need (often called requirements churn), and that unpredicted challenges cannot be easily addressed in a traditional predictive or planned manner. As such, Scrum adopts an [empirical](#) approach—accepting that the problem cannot be fully understood or defined, focusing instead on maximizing the team's ability to deliver quickly and respond to emerging requirements.

## Daily Scrum or Stand-up

Each day during the Sprint, a project team communication meeting occurs. This is called a **daily Scrum**, or **the daily Stand-up**. This meeting has specific guidelines:

- All members of the Delivery Team come prepared with the updates for the meeting
- The meeting starts precisely on time even if some Delivery Team members are missing
- The meeting should happen at the same location and same time every day
- The meeting length is set ([time-boxed](#)) to 15 minutes

During the meeting, each team member answers three questions:

- What have you done since yesterday?

## CMC Software development process

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- What are you planning to do today?
- Any impediments/stumbling blocks? Any impediment/stumbling block identified in this meeting is documented by the Scrum Master and worked towards resolution outside of this meeting. No detailed discussions shall happen in this meeting.

### Scrum of Scrums

Designed and used by multiple Scrum teams to communicate. When there is a large project with multiple Scrum teams, there is typically the requirement to bring these teams together for coordinating the deliverable of any given feature or release.

Each day normally **after** the Daily Scrum:

- These meetings allow clusters of teams to discuss their work, focusing especially on areas of overlap and integration.
- A designated person from each team attends (usually the Scrum Master).

The agenda will be the same as the Daily Scrum, plus the following four questions:

- What has your team done since we last met?
- What will your team do before we meet again?
- Is anything slowing your team down or getting in their way?
- Are you about to put something in another team's way?

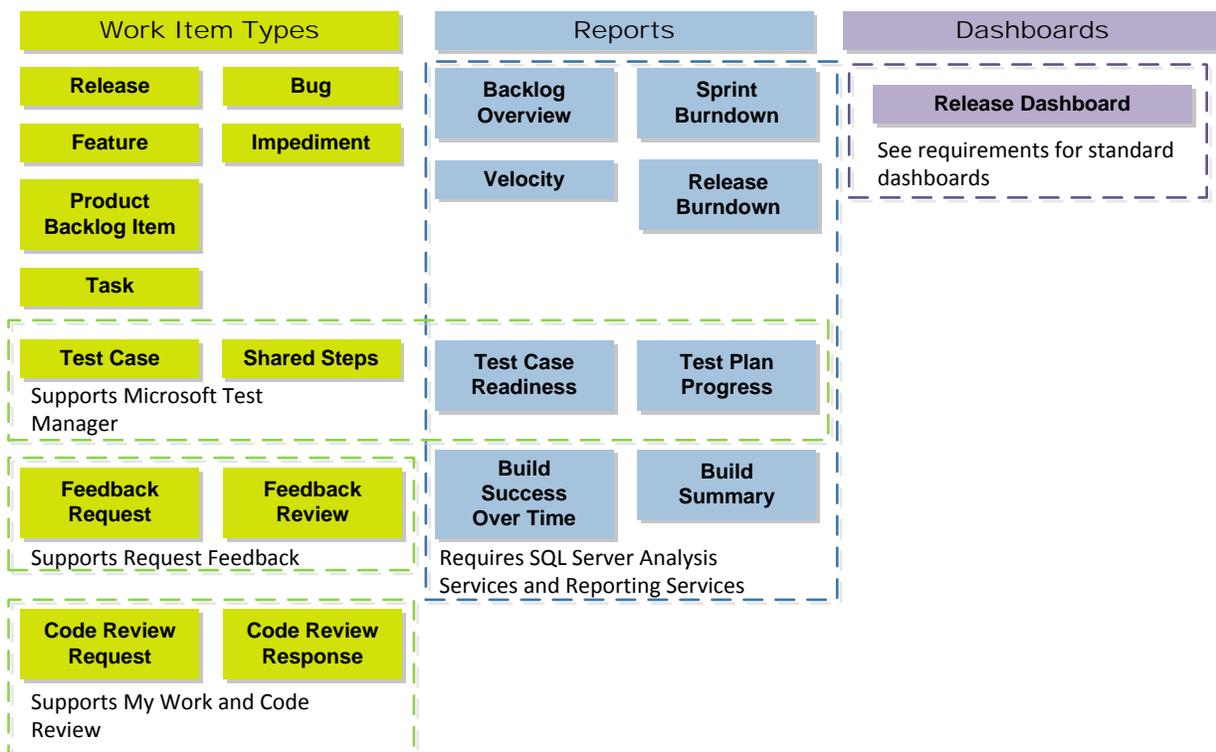
# CMC Software development process

## Tooling (Team Foundation Server – TFS)

Campus Management is using TFS (Team Foundation Server) and Visual Studio to manage our Scrum processes.

### Define and track work

TFS uses work items (WITs or Work Item Types) to track, monitor, and report the development progress of a product and its features. A WIT is a database record that you create in Visual Studio Team Foundation Server (or via the web using TFS Team Explorer - [http://tfs:8080/tfs/\\_home](http://tfs:8080/tfs/_home)) to record the definition, assignment, priority, and state of work. The process template for Visual Studio Scrum 2013.2 defines the following types of work items. These WITs are also the Scrum Artifacts:



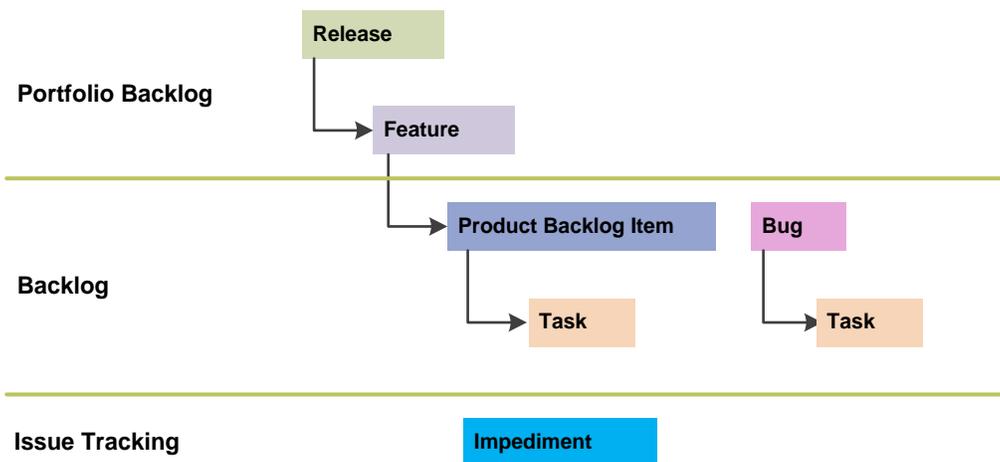
All of these are described in more detail in the TFS Work Item Type (WIT) Management Guidelines.

# CMC Software development process

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TFS allows you to specify and update information for each work item on the form for that item. You can access artifacts either from a Team Foundation client (Visual Studio) or via a Team Web Access page.

For further reading on TFS, the Scrum template in TFS and ALM (Application Lifecycle Management) please refer to the following link - <http://msdn.microsoft.com/en-us/library/ij920147.aspx>



## Additional Scrum Artifacts via TFS

### Increment

The *increment* is the sum of all the Product Backlog Items completed during a Sprint and all previous Sprints. At the end of a Sprint, the Increment must be done according to the Scrum Team's definition of done. The increment must be in usable condition regardless of whether the Product Owner decides to actually release it. In TFS this is instantiated in the Iteration Path field on the TFS WITs.

### Burndown



A sample Burndown chart for a completed iteration, showing remaining effort and tasks for each of the 21 work days of the 1-month iteration

The Sprint [Burndown chart](#) is a publicly displayed chart showing remaining work in the Sprint backlog. Updated every day, it gives a simple view of the Sprint progress. It also provides quick visualizations for reference. There are also other types of Burndown, for example the *release Burndown chart* that shows the amount of work left to complete the target commitment for a Product Release (normally spanning through multiple iterations) and the *alternative release Burndown chart*, which basically does the same, but clearly shows scope changes to Release Content, by resetting the baseline.

It should not be confused with an [earned value chart](#).

# CMC Software development process

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## Additional References

For more information on Scrum please reference – recommended order or viewing/reading:

- <http://www.youtube.com/watch?v=aQrsVfjbQZ4> – More detailed overview of Scrum 101 – Part 1 – Concepts
- <http://www.youtube.com/watch?v=29dnS7XGgqs> – More detailed overview of Scrum 101 – Part 2 – Concepts
- [http://www.youtube.com/watch?v=-UUrLxNBK\\_g](http://www.youtube.com/watch?v=-UUrLxNBK_g) - A sample of a Scrum Stand-up using TFS
- <http://www.youtube.com/watch?v=9MRbY8RqQdU> – A very detailed overview of Scrum using TFS
- <https://www.scrum.org/Scrum-Guide> – The first point of reference for Scrum as it is being implemented at Campus Management.
- [http://www.amazon.com/Enterprise-Scrum-Ken-Schwaber/dp/0735623376/ref=la\\_B001H6ODMC\\_1\\_4?ie=UTF8&qid=1363180756&sr=1-4](http://www.amazon.com/Enterprise-Scrum-Ken-Schwaber/dp/0735623376/ref=la_B001H6ODMC_1_4?ie=UTF8&qid=1363180756&sr=1-4) – Ken Schwaber’s book on Scrum.
- <http://msdn.microsoft.com/en-us/library/jj161049.aspx> - Microsoft references on ALM, Scrum Management, Estimating, 12 steps in a Scrum Framework, etc. **The entire section is worth reading to have a very detailed understanding of Scrum and its related processes.**
- <http://scrumtrainingseries.com/> - a complete series on Scrum
  - Two of these are **very important** for the SM and PO to review and understand.
    - Refinement  
<http://scrumtrainingseries.com/BacklogRefinementMeeting/BacklogRefinementMeeting.htm>
    - Sprint Planning  
<http://scrumtrainingseries.com/SprintPlanningMeeting/SprintPlanningMeeting.htm>

They essentially define the “*contract terms and agreement*” between the SM and PO.

The following links provide additional guidance - basically these are **How Do I:**

- 1) Backlog Management
  - a. Prioritize/Manage the Backlog - <http://msdn.microsoft.com/en-US/library/ee518933.aspx>
  - b. Manage my Backlog with a Kanban board - <http://msdn.microsoft.com/en-us/library/jj838789.aspx>
  - c. Work form the Kanban board - <http://tfs.visualstudio.com/en-us/learn/view-your-kanban-board>
- 2) Sprint Management Including Capacity
  - a. Define / Work in Sprint(s)
    - i. <http://msdn.microsoft.com/en-us/library/ee191595.aspx>
    - ii. <http://msdn.microsoft.com/en-us/library/hh500418.aspx>
  - b. Do Sprint Planning - <http://tfs.visualstudio.com/en-us/learn/plan-your-sprint.aspx>
  - c. Forecasting a Sprint - <http://msdn.microsoft.com/en-us/library/dn283465.aspx>
- 3) Team Management
  - a. Add another Team - <http://msdn.microsoft.com/en-us/library/hh500414.aspx>
  - b. Add or change Team members - <http://msdn.microsoft.com/en-us/library/jj920206.aspx>
  - c. Track my work on each team - <http://msdn.microsoft.com/en-us/library/dn194475.aspx>
    - i. With 2013 you will be able to track your work across teams.
  - d. Team Activities (including Team Room) - <http://msdn.microsoft.com/en-us/library/hh409274.aspx>

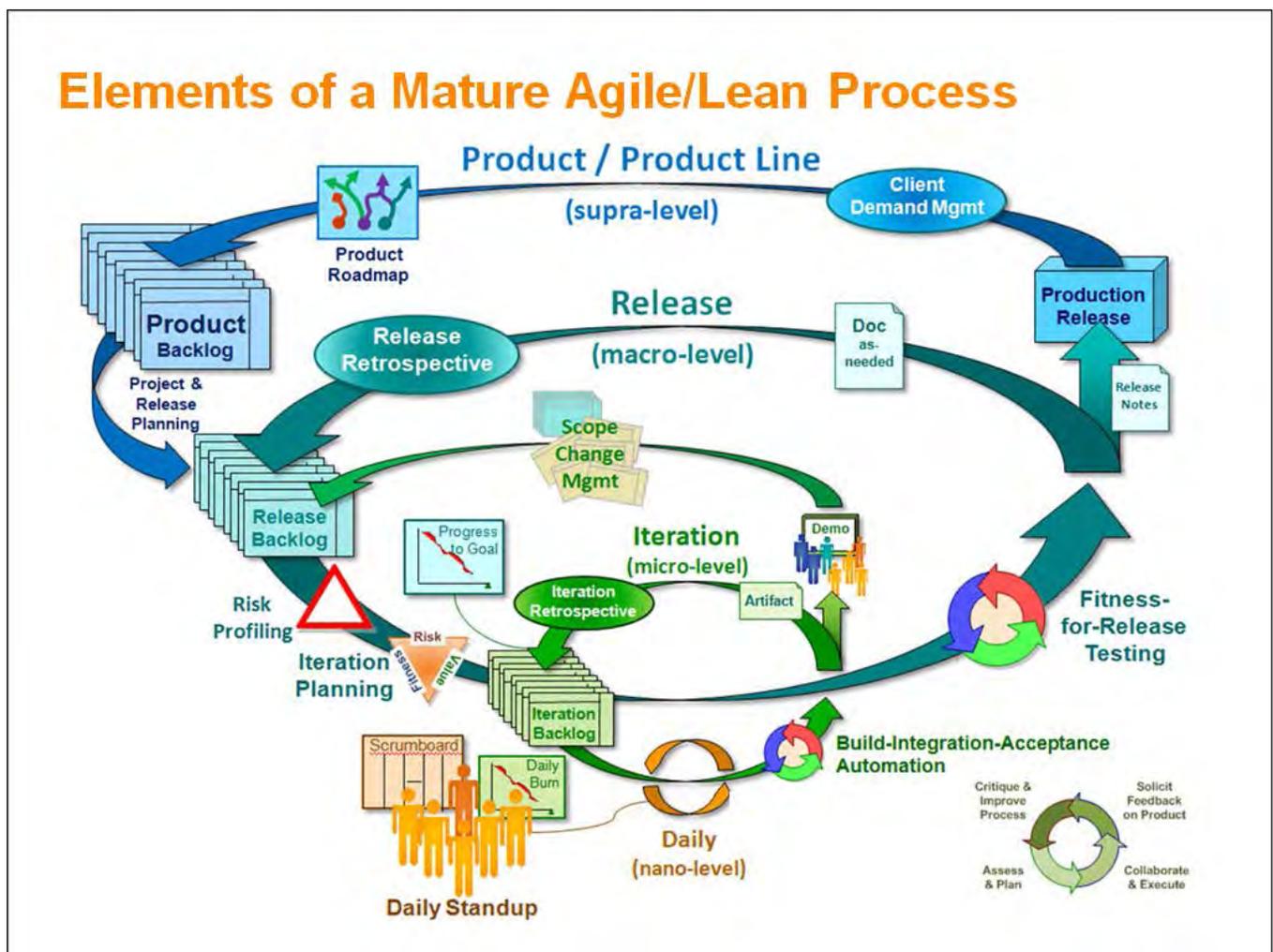
# CMC Software development process

The diagrams that follow provide an overview of the Enterprise Scrum – from Product Planning at the strategic level down to the day-to-day activities of a Scrum Team.

The first diagram shows functionally how activities at four different levels inter-relate: these levels are denoted 'Supra', 'Macro', 'Micro' and 'Nano'.

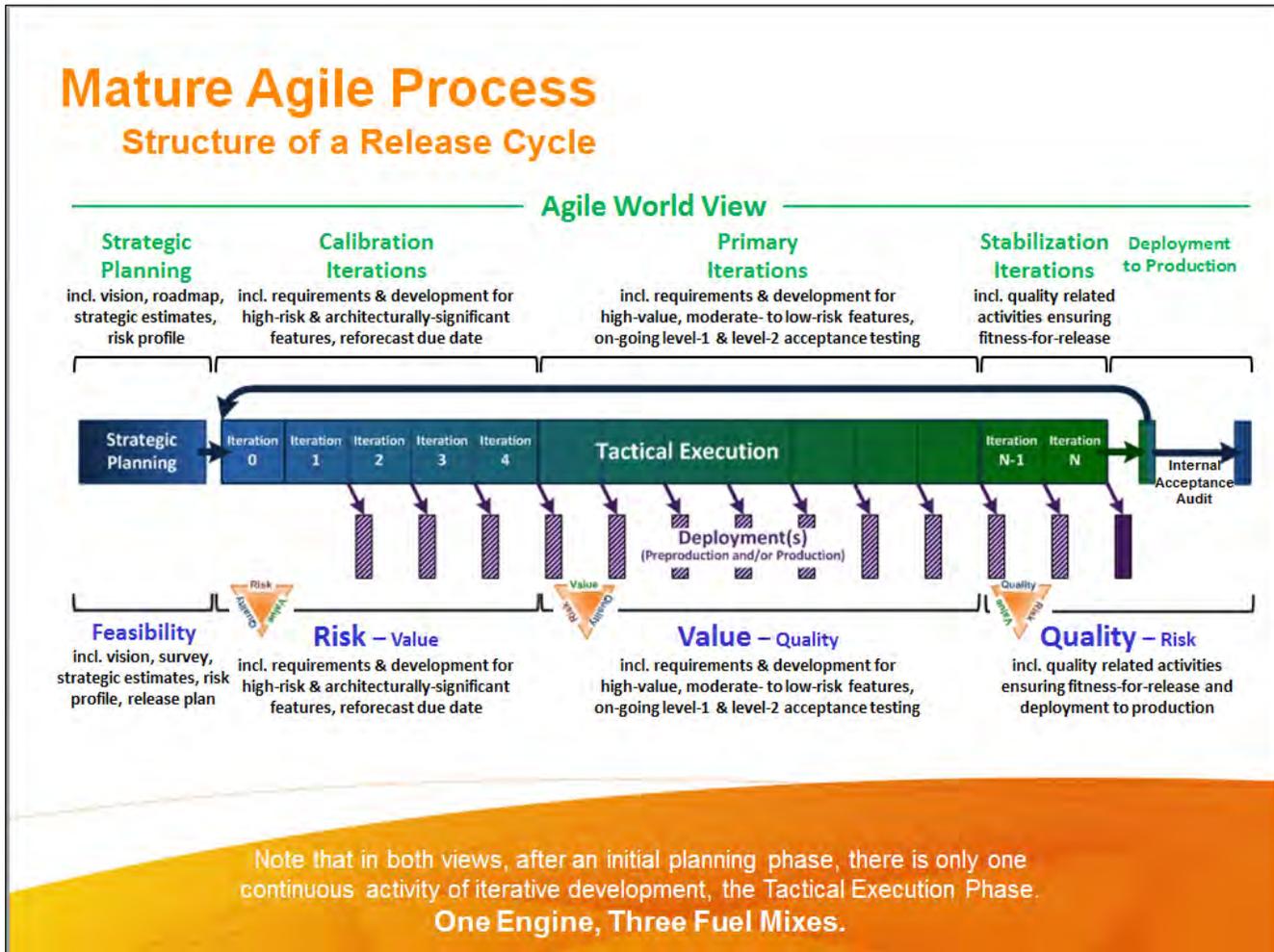
1. Supra: Product & Product Line Road mapping.
2. Macro: Release Planning & Execution.
3. Micro: Sprint Planning & Execution.
4. Nano: Daily Scrum Activities.

**\*Note:** many of the questions raised while reading this document may be addressed in the [Frequently Asked Questions](#) section.



# CMC Software development process

This second diagram shows chronologically how the individual Sprints constitute a complete release cycle, from Strategic Planning and Inception through Stabilization and Internal Acceptance Audit.



**Item 4: CampusNet Service Level Agreement**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.

# EXHIBIT C-4

## CAMPUSNET® SERVICE LEVEL AGREEMENT

CMC provides this CampusNet Service Level Agreement ("SLA") subject to the terms and conditions below.

### A. Monthly Service Level

1. The Service Level is 99.7%.
2. The Monthly Uptime Percentage is calculated for a given calendar month using the following formula:

<b>Monthly Uptime Percentage =</b>		
Total number of minutes in a given calendar month	<b>minus</b>	Total number of minutes of Downtime in a given calendar month
Total number of minutes in a given calendar month		

### B. Service Credits

1. Should the Service Level fall below 99.7% for a given month, CMC shall provide a Service Credit as noted in the chart below:

Monthly Uptime Percentage	Service Credit*
< 99.7%	25%
< 99%	50%
< 95%	100%

\*Service Credit will be issued against the applicable month's Subscription Fee paid by Customer for the Service.

2. A Service Credit is Customer's sole and exclusive remedy for any violation of this SLA.
3. A Service Credit awarded in any calendar month shall not, under any circumstance, exceed Customer's monthly Subscription Fee.

### C. Claims

1. In order to make a Claim, Customers must be in compliance with policies for acceptable use of the Service found in the Agreement.
2. In order to be eligible to submit a Claim with respect to any Incident, the Customer must first have notified CMC support service of the Incident **within five (5) business days following an Incident** by calling 1-800-483-9106 or e-mail at CMC's support web-site at [support@campusmgmt.com](mailto:support@campusmgmt.com). Customer must provide all reasonable details regarding the Incident including but not limited to, detailed description of the Incident, the duration of the Incident, the number of affected users and the locations of such users and any attempts made by Customer to resolve the Incident.
3. Customer must submit the Claim to CMC support service by calling 1-800-483-9106 or e-mail at [hostingclaims@campusmgmt.com](mailto:hostingclaims@campusmgmt.com) and providing any additional evidence reasonable required by CMC to support the Claim (as set forth in Section C(2) above), by the end of the month following the month in which the Incident which is the subject of the Claim occurs (for example, Incident occurs on January 15<sup>th</sup>, Customer provides Notice on January 20<sup>th</sup>, Customer must provide sufficient evidence to support Claim by February 28<sup>th</sup>).
4. CMC will use all information reasonably available to it to validate Claims and make a good faith judgment on whether the SLA and Service Levels apply to the Claim.
5. CMC will use commercially reasonable efforts to process Claims within 45-days.

#### **D. Exclusions**

1. Downtime does not include:
  - a. The period of time when the Service is not available as a result of Scheduled Downtime; or
  - b. Performance or availability issues that may affect the Service:
    - i. Due to factors outside CMC's reasonable control;
    - ii. Related to add-on features for the Service, including, but not limited to Reporting Services;
    - iii. That resulted from Customer's or third party hardware, software or services;
    - iv. That resulted from actions or inactions of Customer or third parties;
    - v. That resulted from actions or inactions by Customer or Customer's employees, agents, contractors, or vendors, or anyone gaining access to CMC's network by means of Customer's passwords or equipment.
    - vi. That were caused by Customer's use of the Service after CMC advised Customer to modify its use of the Service, if Customer did not modify its use as advised;
    - vii. Intermittent periods of Downtime that are ten minutes or less in duration; or
    - viii. Through Customer's use of beta, trial offers, early access programs and/or demos (as determined by CMC).

#### **E. Definitions:**

1. "Agreement" means the CampusNet® Hosting Service Schedule that governs the Service.
2. "Claim" means a claim submitted by Customer to CMC that a Service Level under this SLA has not been met and that a Service Credit may be due to Customer.
3. "CMC" means Campus Management Corp.
4. "Customer" means the person or organization that contracted for Services under the Agreement.
5. "Downtime" means a period of time when Customers are unable to access the Service at the furthest point on CMC's firewall facing the public Internet.
6. "Exclusions" means the performance or availability issues that are noted in Section D.
7. "Incident" means a set of circumstances resulting in an inability to meet a Service Level.
8. "Notice" means that within five (5) business days following an Incident, Customer must notify Customer Support of the Incident.
9. "Service" or "Services" means the hosting service provided to Customer pursuant to the Agreement.
10. "Scheduled Downtime" means published maintenance windows or times where CMC notifies Customer of periods of Downtime for scheduled network, hardware, Service maintenance or Service upgrades at least twenty-four (24) hours prior to the commencement of such Downtime, except for unforeseen emergency maintenance that can be carried out during the next published maintenance window.
11. "Service Credit" means the amount credited to Customer by CMC for a validated Claim.
12. "Service Level" means the percentage of Service availability for a given month that CMC agrees to provide Customer, which is measured by the Monthly Uptime Percentage.
13. "Subscription Fee" means the monthly amount that Customer pays CMC for their subscription to the Service.

**Item 5: CampusNet Enterprise Cloud Agreement**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.

# CAMPUS MANAGEMENT CORP.

## CAMPUSNET® INFRASTRUCTURE AS A SERVICE (IaaS) AGREEMENT

This **INFRASTRUCTURE AS A SERVICE AGREEMENT**, the Exhibits hereto, and Addenda as mutually executed from time-to-time (collectively, the "Agreement") is effective as of this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ (the "Effective Date"), between \_\_\_\_\_, a \_\_\_\_\_ corporation, having its principal place of business at \_\_\_\_\_ (hereinafter "Customer"), and **CAMPUS MANAGEMENT CORP.**, a Florida corporation, having its principal place of business at 777 Yamato Road, Boca Raton, FL 33431 (hereinafter "CMC").

### BACKGROUND

WHEREAS, CMC is engaged in part in the business of operating an infrastructure as a service business ("CMC IaaS");

WHEREAS, under a software license agreement with CMC (the "Master Agreement" or "Software License Agreement"), Customer has licensed certain software related to the provision of financial and student records management functions; and

WHEREAS, CMC is willing to provide Customer with non-exclusive rights to deploy the approved software on the CMC IaaS in accordance with this Agreement;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

### GENERAL TERMS

#### 1. DEFINITIONS

"Application(s)" means any web or other application Customer creates using the CMC IaaS including any source code written by Customer to be used with the CMC IaaS, or hosted on a Virtual Machine (as defined below).

"CMC Content" means any Content (as defined below) that CMC or any of its affiliates make available in connection with the CMC IaaS (as defined below) to allow access to and use of the CMC IaaS.

"CMC Infrastructure as a Service (IaaS)" means a managed or an unmanaged Virtual Server that is running on the Infrastructure.

"CMC Marks" means any trademark, service marks, service or trade names, logos and other designations of CMC and its affiliates that CMC may make available to Customer in connection with this Agreement.

"Content" means software (including machine images), data, text, audio, video, images or other content.

"Customer Content" means Content that Customer or any User (as defined below) (a) runs on the CMC IaaS, (b) causes to interfere with the CMC IaaS, or (c) uploads to the CMC IaaS under Customer's account or otherwise transfers, processes, uses or stores in connection with Customer's account.

"Documentation" means the developer guides, user guides and any other technical and operations manuals and specifications for the CMC IaaS provided by CMC.

"Infrastructure" means the datacenters, security devices, cables, routers, switches, hosts, computer nodes, physical servers, and other equipment CMC uses to host Virtual Servers (as defined below).

"Login Credentials" mean any password, authentication keys or security credentials that enable Customer's access to and management of the CMC IaaS.

"Policies" means CMC's written policies to the extent applicable (e.g., Acceptable Use Policy, E-mail and Anti-Spam Policies) all of which are posted on the CMC web site at <http://www.campusmanagement.com/EN-US/aboutUs/Pages/CampusNet.aspx>, as may be updated from time to time.

"Third Party Content" means Content made available to Customer by any third party in conjunction with the CMC IaaS.

"User" means any individual that directly or indirectly through another user (a) accesses or uses Customer Content; or (b) otherwise accesses or uses the CMC IaaS under Customer's account.

"Virtual Servers" means one of any number of isolated server emulations running on a single physical server located on the Infrastructure.

#### 2. USE OF THE CMC IAAS

2.1 Generally. Customer may access and use the CMC IaaS in accordance with this Agreement. Customer will adhere to all laws, rules and regulations applicable to its use of the CMC IaaS, including the Policies. The CMC IaaS is provided to Customer for its internal use and Customer shall not resell the CMC IaaS to any third party.

2.2 Third Party Content. Third Party Content, such as software applications provided by third parties, may be made available by other entities under separate terms and conditions. Customer is responsible to comply with applicable terms and conditions for Third Party Content. Customer's use of any Third Party Content is at Customer's sole risk. CMC is not responsible for providing support to Third Party Content.

2.3 Facilities and Use of Customer Data. CMC will maintain appropriate administration, physical and technical safeguards that adhere to security standards that a reasonably prudent service provider in the same industry would provide under like circumstances to store and process Customer Data. CMC accesses and uses Customer Data only as necessary to provide the IaaS Service, perform or enforce contractual obligations or comply with applicable law. By using the CMC IaaS, Customer consents to the processing and storing of Customer Data. The parties agree that CMC is merely an information technology service provider.

#### 3. CHANGES

3.1 To the CMC IaaS. Subject to Section 10.2(a)(ii), CMC may change, discontinue or deprecate the CMC IaaS or change or remove features or functionality of the CMC IaaS from time to time. CMC will provide Customer with six (6) months prior notice of any material changes or discontinuance.

#### 4. CMC OBLIGATIONS

4.1 Scope of Services. The CMC IaaS shall include: (i) the deployment and administration of server hardware and the licensed CMC software at the CMC hosting center; and (ii) monitoring communication circuit that is reasonably within the control of CMC or CMC's Internet service provider and hardware availability; and (iii) routine backups of software and data residing on the data repository location ("Data Repository Location"). This Agreement is strictly for the CMC IaaS described herein and does not grant a license to access or use the CMC software, which must be licensed by Customer under a separate Master Agreement or Software License Agreement, as applicable. The CMC IaaS shall be pursuant to the Service Level Agreement set forth in Exhibit C-4. CMC will not support environments that are not supported/certified by CMC product development or by third party vendors.

4.2 Standard of Performance. CMC agrees to provide the CMC IaaS in a professional and businesslike manner and in accordance with standard industry practices.

4.3 Data Backup. CMC shall perform a complete backup of the Data Repository Location each night using generally accepted backup procedures ("Backup Data"). The Backup Data shall be maintained at the CampusNet Services colocation center and shall be retained for up to seven (7) days before being destroyed; provided, weekly, CMC shall make a copy of the Backup Data and store it at an off-site storage location ("Off-site Center"). The Backup Data shall be retained at the Off-site Center for twelve (12) months before being destroyed. Upon Customer request and for no additional charge, so long as Customer is not in default of the Agreement, CMC shall provide a copy of the Backup Data on a monthly basis. For an additional charge, Customer may request a copy of the Backup Data on a more frequent basis. The CMC IaaS is operated in a manner designated to provide for high levels of system availability. This includes redundancy for all major system components, or where appropriate, equipment supported by manufacturers providing the CMC IaaS with 24/7/365 service.

4.4 Availability of Service. The CMC IaaS and all Customer Content shall be accessible to Customer's authorized users 24 hours per day, 7 days a week, excluding scheduled times for maintenance and updates of CMC IaaS infrastructure software of which Customer will be notified in advance, and any Downtime (as defined in Section 4.9 below) due to Internet outages resulting from failures reasonably outside the control of CMC or CMC's hosting provider, corruption of Internet route information within a tier 1 internet route server environment, major connectivity failures within or between major tier 1 providers or corruption of internet root level DNS services. In the event that, during any three (3) month period, the Customer Content experiences three or more episodes of Downtime with one or more episodes of Downtime lasting at least six (6) hours each and two (2) or more additional episodes of Downtime lasting at least three (3) hours each, Customer shall have the right to terminate this Agreement immediately upon forty eight (48) hours notice to CMC, without payment of any penalty, which termination right shall be Customer's sole and exclusive remedy for Downtime other than Downtime caused by CMC's willful misconduct. For clarification, "Downtime" shall exclude service disruptions arising from Customer's systems or service providers or service disruptions due to Customer's own errors. CMC will pass through, on a proportionate basis, to Customer any credits received from its third party hosting provider as a result of the Downtime.

4.5 Control of Services. CMC shall manage the CMC IaaS. CMC may, in its sole discretion (i) reengineer CMC network components and/or change locations where services are performed; (ii) perform its obligations through its subsidiaries or affiliates, or through the use of selected independent subcontractors; and (ii) modify and/or replace technology or service architectures relating to the services. Notwithstanding clause (ii) above, CMC shall be responsible for such other party's performance of CMC obligations under CMC IaaS.

4.6 Personnel. CMC will dedicate personnel necessary to perform its responsibilities hereunder. CMC reserves the right to determine the personnel assigned to the CMC IaaS and to replace, rotate or reassign such personnel during the CMC IaaS Term (as defined in Section 10.1 below).

4.7 Services Outside Scope. Any custom services provided outside the scope set forth above shall be engaged under professional services, subject to CMC's requirements, including, without limitation, any billing, and technical requirements. Any changes in federal, state or local requirements, or any Customer specific requirements, including, without limitation, with respect to security or privacy, that result in CMC providing additional services or incurring costs, shall be billed to and promptly paid by Customer. CMC reserves the right to refuse to provide certain services in the event Customer's requirements are not practicable or changes in law affect CMC's performance of obligations hereunder.

4.8 Minimization of Planned Service Disruptions. Whenever conditions reasonably permit, the parties will mutually agree on the scope, timing, frequency and duration of any planned service disruptions or delays and will jointly attempt to minimize any unnecessary impact on Customer's business operations. Routine daily maintenance will be accomplished whenever possible by scheduling between the hours of 10:00 p.m. and 8:00 a.m. Eastern Time. In addition, longer maintenance will be accomplished when possible on weekends between the hours of 6:00 p.m. ET Saturday and 8:00 a.m. ET Monday, unless CMC notifies Customer otherwise. CMC shall monitor the CMC IaaS Services 24/7/365.

4.9 Unplanned Service Disruptions. Unplanned service disruptions ("Downtime") may occur from time-to-time. CMC will use commercially reasonable efforts to attempt to prevent Downtime that could impact Customer's business operations to the extent such factors are within CMC's reasonable control; provided, Customer acknowledges that conditions of Customer and third parties may affect Customer's use of the CMC IaaS, for which CMC shall have no liability or obligations (by way of example and not limitation, Internet disruptions or third party software bugs), although CMC will attempt to coordinate with Customer as reasonably requested to assist to correct the Downtime to the extent practicable.

4.10 Disaster Recovery Plan. Throughout the CMC IaaS Term, CMC shall maintain a disaster recovery plan and the capacity to execute such plan. Upon request by Customer, which shall not be more frequently than annually, CMC shall provide Customer with an executive summary of CMC's most current disaster recovery plan.

#### 5. CUSTOMERS OBLIGATIONS

5.1 Technical Data and Information. Customer shall provide CMC with all technical data and all other information CMC may reasonably request from time to time to

allow CMC to supply the CMC IaaS to Customer. All information Customer supplies will be complete, accurate and given in good faith.

5.2 Lawful Use. Customer will use the CMC IaaS for legitimate and lawful business purposes only. Any breach of this Section 5.2 will constitute a material breach of this Agreement and in addition to CMC's termination rights set forth in Section 10.2(b) below, CMC may, at any time and at CMC's sole option, suspend all or part of the CMC IaaS immediately and until the breach is remediated.

5.3 Content. Customer is solely responsible for the Customer Content that Customer, Users or subcontractors create, install, upload or transfer on, from or through the CMC IaaS.

5.4 Backups. Customer is solely responsible for backing up all Customer Content on the CMC IaaS to the Data Repository Location. Customer acknowledges and agrees to maintain outside the CMC IaaS a current backup copy of all Content stored in the CMC IaaS.

5.5 Customer Relationship Manager. Customer will appoint a relationship manager to manage the relationship established by this Agreement ("Customer Relationship Manager") who will:

5.5.1 Coordinate and monitor Customer's obligations under this Agreement, and serve as the primary liaison with the CMC relationship manager.

5.5.2 Provide communication on events and reporting problems with the CMC IaaS.

5.5.3 Provide CMC with an outage communications plan consisting of the name, telephone number including cell phone number, and email address of Customer personnel to be notified in the event of an outage. CMC shall contact Customer promptly regarding an outage or Downtime.

5.6 Connectivity. Customer agrees to provide the high-speed Internet and telecommunications connections and supporting equipment required by CMC to maintain connectivity between Customer's remote location(s) and the CMC IaaS location. Customer will bear the costs of such connections and supporting equipment. CMC may assist Customer in defining such connectivity in which case Customer may, at CMC's discretion, be billed for such professional services.

5.7 Software Licenses. CMC software and the CMC IaaS use many components of Microsoft products. At all times during the CMC IaaS Term, Customer is required to hold a basic Microsoft® Office license for each Customer computer that will be used on the CMC IaaS. To the extent applicable, Customer's statement attesting to the existence of such valid license is attached as Exhibit C-2.

5.8 Print Drivers. CMC uses the Citrix universal print driver. Other printers may work, but Customer acknowledges that formatting and functionality may fail on any non-compliant printing standards or drivers. Customer may require assistance from its authorized printer vendor.

## 6. SECURITY AND DATA PRIVACY

6.1 Security. CMC IaaS provides Customer with certain software and functionality to help Customer protect Customer Content from unauthorized access. Customer shall properly configure and use the CMC IaaS so that it is suitable for Customer's use. Customer is responsible for maintaining appropriate security and protection of Customer Content,

which may include the use of encryption technology to protect Customer Content from unauthorized access. Customer is responsible for providing any necessary notices to Users and obtaining any legally-required consents from Users concerning use of the CMC IaaS. Customer is solely responsible for complying with any laws or regulations that might apply to Customer Content. Login Credentials are for Customer's internal use only. Customer is responsible for any use that occurs under Login Credentials. If Customer believes an unauthorized User has gained access to Login Credentials, Customer will notify CMC immediately. Neither CMC nor its affiliates are responsible for any unauthorized access to or use of Customer's account. If CMC determines that there has been unauthorized access to, or use or disclosure of, Customer Content, CMC shall use commercially reasonable efforts to notify Customer, taking into account any applicable law, regulation, or governmental request.

6.2 Transfer of Data. Customer consents that CMC shall store Customer Content in the United States. CMC transfers Customer Data solely pursuant to CMC's Backup Data obligations as set forth in Section 4.3 above. By uploading Customer Content into the CMC IaaS, Customer may transfer and access Customer Content from around the world, including to and from the United States. To the extent that Customer provides Customer Content in connection with CMC customer support, Customer consents that CMC may handle Customer Content in any country in which CMC or its affiliates maintain facilities. It is the responsibility of Customer to ensure that Customer complies with applicable law with respect to transferring data across geographical locations.

6.3 Compliance with Laws. CMC shall comply with all laws applicable to our provision of the CMC IaaS, including applicable security breach notification laws, but not including any laws applicable to Customer that are not generally applicable to information technology service providers. Customer shall comply with all laws applicable to Customer Data and Customer's use of the CMC IaaS, including any laws applicable to Customer.

## 7. FEES, PAYMENT AND TAXES

7.1 General. The pricing for the CMC IaaS provided herein is set forth in Exhibit A.

7.2 Late Fees. Any amount invoiced under this Section 7 and not paid in full as required herein shall bear interest at the lesser of 1.5% per month or the highest rate allowed by applicable law, and shall be subject to reasonable costs and attorney's fees related to collection. Upon written notice, CMC reserves the right to suspend any or all services to delinquent accounts until such time as the account is brought current and Customer agrees to hold CMC harmless for any interruption of CMC IaaS arising from any payment delay.

7.3 Taxes. Customer will promptly pay, indemnify and hold CMC harmless from all taxes on the CMC IaaS, including transaction, local, value-added, sales and service taxes, other than taxes on the net income or profits of CMC. Subject to any applicable laws, the foregoing will not apply to the extent Customer is formed as a not-for-profit or publically funded state organization and promptly provides CMC an applicable tax exempt certificate. All prices quoted are net of taxes.

7.4 Disputed Invoice. Customer may withhold any invoiced line item amounts due hereunder if it, in good faith, disputes the item in a detailed writing within twenty (20) days of receipt of the invoice and promptly pays the undisputed amounts. CMC reserves the right to cease work without

prejudice if undisputed amounts are not paid within thirty (30) days after the date of the invoice. CMC may allocate payments received to fees and expenses in its sole discretion and Customer's communications on or with payments shall not be construed as a novation.

## 8. BILLING AND PAYMENT PROCEDURES

8.1 Payment Schedule. CMC will bill Customer as further described in Exhibit A.

8.2 Billing and Payment Dates. CMC will bill Customer monthly by the 10<sup>th</sup> of the following month as set forth in Exhibit A. Customer shall pay CMC in full on or before the fifteenth (15<sup>th</sup>) day following the date of the invoice. If Customer falls into arrears on payments, CMC may require Customer to maintain a deposit as a condition to CMC continuing to provide the CMC IaaS.

8.3 Changes. Customer may request to expand the CMC IaaS by delivering a written request and entering into a mutually executed Addendum.

## 9. TEMPORARY SUSPENSION

9.1 Generally. CMC may suspend Customer's right to access or use any portion of all of the CMC IaaS immediately upon notice to Customer if:

(a) Customer's use of the CMC IaaS (i) poses a security risk to the CMC IaaS or any third party; (ii) may adversely impact the CMC IaaS or the systems or Content of any other CMC customer; (iii) may subject CMC, its affiliates or any third party to liability; (iv) may be fraudulent; or (v) violates Policies;

(b) Suspension is required pursuant to CMC's receipt of a subpoena or other request by a law enforcement agency; or

(c) Customer is in breach of this Agreement, including Customer is delinquent on its payment obligations (except for Section 7.4 above) for more than 30 days.

9.2 Effect of Suspension. If CMC suspends Customer's right to access or use any portion or all of the CMC IaaS:

(a) Customer is responsible for all fees and charges Customer has incurred through the date of suspension;

(b) Customer remains responsible for any applicable fees and charges for any CMC IaaS to which Customer continues to have access, as well as applicable data storage fees and charges, and fees and charges for in-process tasks completed after the date of suspension; and

(c) Customer will not receive any service credits under the Service Level Agreement for any period of suspension.

CMC will not erase any Customer Content as a result of Customer's suspension. CMC's right to suspend Customer's access to CMC IaaS is in addition to CMC's right to terminate this Agreement pursuant to Section 10 below.

## 10. TERM AND TERMINATION

10.1 Term. The CMC IaaS will commence on the Commencement Date and will continue for the period specified in Exhibit A ("CMC IaaS Term").

10.2 Termination.

(a) Customer: Customer may terminate this Agreement:

(i) with cause in the event CMC materially breaches its obligations under the Agreement and fails to cure such breach within thirty (30) days after receipt of written notice from Customer.

(ii) early upon sixty (60) days written notice and payment of early termination fee as set forth in Exhibit A.

(b) CMC. CMC may terminate this Agreement:

(i) with cause in the event Customer materially breaches its obligations under the Agreement and fails to cure such breach within thirty (30) days after receipt of written notice from CMC.

(ii) immediately upon notice to Customer: (A) for cause, if any act or omission by Customer results in a suspension described in Section 9.1 above; (B) if CMC's relationship with a third party who provides software or other technology CMC uses to provide the CMC IaaS expires, terminates or require CMC to change the way it provides the software or other technology as part of the CMC IaaS; (C) if it is CMC's good faith belief that providing the CMC IaaS could create a substantial economic or technical burden or material security risk for CMC; (D) in order to comply with the law or requests from governmental entities; or (E) if CMC determines that the use of the CMC IaaS has become impractical or unfeasible for any legal or regulatory reason.

10.3 Effect of Termination. Upon termination of the CMC IaaS for any reason, CMC will disable Customer's access to the CMC IaaS and Customer shall promptly pay all amounts due. Each party shall promptly return or destroy any of the other party's Content or Confidential Information (as defined below). CMC may erase Customer Content stored on the Infrastructure thirty (30) days after the date of termination. Customer will pay CMC its reasonable fees and expenses on a time and material basis if CMC assists Customer with the transition of Customer Content.

## 11. CONFIDENTIAL INFORMATION

11.1 Confidential Information. Neither party nor any third party acting on its behalf will for any reason at any time use or disclose any proprietary information of the other party, including, without limitation, relating to the processes, techniques, work practices, customers, prospective customers, suppliers, vendors, business practices, strategies, business plans, financial information, marketing, third party licenses, products, proprietary rights or trade secrets of the other party (collectively the "Confidential Information"). Each party shall use at least the same degree of care in safeguarding the other party's Confidential Information as it uses in safeguarding its own Confidential Information, but not less than due diligence and care, to prevent the theft, disclosure, copying, reproduction, distribution and preparation of derivative works of the other party's Confidential Information. Either party may disclose Confidential Information to its employees, independent contractors and advisors that have a need to know in the course of their assigned duties and responsibilities in connection with the Agreement, provided such parties are bound by legally binding obligations to protect such Confidential Information in a manner consistent with the Agreement.

11.2 Exceptions. Confidential Information does not include (i) information already known or independently developed by the recipient without use or reliance on the other party's Confidential Information, as evidenced by records, (ii) information in the public domain through no wrongful act of

the recipient, or (iii) information received from a third party who was not under a duty of non-disclosure.

11.3 Disclosure Required by Law. If one party (the "Receiving Party") is required by a lawful order from any court or agency of competent jurisdiction to disclose Confidential Information of the other party ("Disclosing Party"), the Receiving Party shall promptly notify the Disclosing Party of such order so that the Disclosing Party may take reasonable steps to limit further disclosure, including obtaining a protective order or other reasonable assurance that confidential treatment will be accorded to the Confidential Information. If, in the absence of a protective order, the Receiving Party is compelled as a matter of law to disclose Confidential Information, the Receiving Party will use reasonable efforts to disclose only the Confidential Information that is required by law to be disclosed.

With respect to publically funded state institutions, CMC acknowledges that certain information and documents may be subject to public records laws, and Customer shall provide CMC an opportunity to review and object to disclosure (including obtaining a protective order) pursuant to state law.

11.4 Remedies. Confidential Information shall remain the sole property of the Disclosing Party or its respective licensor. In the event of a breach or threatened breach of this provision, the Disclosing Party shall be entitled to obtain preliminary injunctive relief, without posting bond, to prevent the use and disclosure of such Confidential Information, in addition to all other remedies available at law and in equity.

## 12. INTELLECTUAL PROPERTY

12.1 CMC Content; CMC IaaS; License Grant. CMC, its affiliates and licensors own and reserve all right, title and interest in and to the CMC IaaS and CMC Content, including all improvements, enhancements, modifications and derivatives works thereof. CMC shall have a royalty-free, worldwide, perpetual license to use or incorporate into the CMC IaaS and Documentation any suggestions, ideas, enhancement requests, feedback, recommendations or other information provided by Customer or its Users relating to the operation of the CMC IaaS or Documentation. CMC grants Customer a non-exclusive and non-transferable license to do the following: (i) access and use the CMC IaaS solely in accordance with this Agreement; and (ii) copy and use the CMC Content solely in connection with Customer's permitted use of the CMC IaaS.

12.2 Restrictions. Customer shall not (and shall not permit any User, employee, contractor or other party to): (i) copy, modify, create a derivative work of, reverse engineer, decompile, translate, disassemble or otherwise attempt to extract the source code of the CMC IaaS or any component thereof; or (ii) resell or sublicense the CMC IaaS.

12.3 Customer Content. Customer or Customer's licensor own all right, title and interest in and to Customer Content. Except as provided in this Section 12, CMC obtains no rights under this Agreement to Customer Content. Customer consents to CMC's use of Customer Content to provide the CMC IaaS to Customer. CMC may disclose Customer Content to provide the CMC IaaS to Customer and User or comply with any request of a governmental or regulatory body.

12.4 Trademarks and Copyrights. Third parties retain trademark, copyright and other proprietary rights in and to Third Party Content. CMC retains all right, title and interest to CMC Marks.

## 13. WARRANTIES

13.1 CMC's Limited Warranties. CMC represents, warrants and covenants that:

(a) CMC has the authority to enter into this Agreement.

(b) Neither it entering into nor its performance of this Agreement conflicts with or creates a breach of contract or obligation to which it is bound.

(c) CMC shall perform the CMC IaaS in a professional and workmanlike manner.

(d) CMC, in the operation of its business, shall remain at all times during the Agreement in compliance in all material respect with applicable federal, state and local laws, including, without limitation, all applicable U.S. Department of Education rules and regulations.

13.2 Customer's Limited Warranties. Customer represents, warrants and covenants that:

(a) Customer has authority to enter into and perform in accordance with the provisions of this Agreement.

(b) Neither it entering into nor its performance of this Agreement conflicts with or creates a breach of contract or obligation to which it is bound.

(c) No Customer Content on the CMC IaaS is illegal, defamatory, malicious, harmful or discriminatory based on race, sex, religion, nationality, disability, sexual orientation, or age.

(d) Customer will not attempt to circumvent or disable any of the security-related, management or administrative features of the CMC IaaS.

(e) Customer, in the operation of its business, shall remain at all times during the Agreement in compliance in all material respects with applicable federal, state and local laws, including, without limitation, all applicable U.S. Department of Education rules and regulations.

14. **DISCLAIMER OF WARRANTIES**. THE CMC IAAS IS PROVIDED "AS IS". CMC AND ITS AFFILIATES AND LICENSORS MAKE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE REGARDING THE CMC IAAS OR THE THIRD PARTY CONTENT, INCLUDING ANY WARRANTY THAT THE CMC IAAS OR THIRD PARTY CONTENT WILL BE UNINTERRUPTED, ERROR FREE OR FREE OF HARMFUL COMPONENTS, OR THAT ANY CONTENT, INCLUDING CUSTOMER CONTENT OR THIRD PARTY CONTENT, WILL BE SECURE OR NOT OTHERWISE LOST OR DAMAGED. CUSTOMER ACKNOWLEDGES THAT CMC DOES NOT CONTROL OR MONITOR THE TRANSFER OF DATA OVER THE INTERNET, AND THAT INTERNET ACCESSIBILITY CARRIES WITH IT THE RISK THAT CUSTOMER'S PRIVACY, CONFIDENTIAL INFORMATION AND PROPERTY MAY BE LOST OR COMPROMISED. EXCEPT TO THE EXTENT PROHIBITED BY LAW, CMC, ITS AFFILIATES AND LICENSORS DISCLAIM ALL WARRANTIES, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT AND ANY WARRANTIES ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICE.

**15. LIMITATION OF LIABILITY.** EXCEPT FOR THE OBLIGATIONS HEREIN TO INDEMNIFY AGAINST THIRD PARTY CLAIMS OR BREACH OF INTELLECTUAL PROPERTY RIGHTS, IN NO EVENT SHALL EITHER PARTY OR ITS AFFILIATES BE LIABLE, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES (INCLUDING LOST SAVINGS, PROFIT OR BUSINESS INTERRUPTION EVEN IF NOTIFIED IN ADVANCE OF SUCH POSSIBILITY) ARISING OUT OF OR PERTAINING TO THE SUBJECT MATTER OF THIS AGREEMENT. IN ADDITION, EXCEPT WITH RESPECT TO A WILLFUL BREACH, BREACH OF INTELLECTUAL PROPERTY RIGHTS, OR OBLIGATIONS HEREIN TO INDEMNIFY AGAINST THIRD PARTY CLAIMS, NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR DAMAGES IN EXCESS OF THE TOTAL AMOUNT PAID FOR CMC IAAS DURING THE TWELVE MONTH PERIOD IMMEDIATELY PRECEDING THE DATE ANY SUCH CAUSE OF ACTION AROSE.

The foregoing limitation of liability shall not be construed as an express or implied waiver by a publically funded state institution of its governmental immunity or as an express or implied acceptance by the institution of liabilities arising as a result of actions which lie in tort or could lie in tort in excess of the liabilities allowed under applicable state law.

**16. INDEMNIFICATION**

**16.1 Customer.** Customer shall indemnify, defend and hold harmless CMC and its affiliates, and each of its respective officers, directors, employees, agents, independent contractors, successors and assigns from and against liability for any third party claims based on: (i) Customer's use of the CMC IaaS or any Customer Content; (ii) breach of this Agreement or violation of applicable law; (iii) the alleged infringement or misappropriation of third party rights by Customer Content or by the use, development, design, production, advertising or marketing of Customer Content; (iv) Customer's relationship with third party software providers for software installed or stored in the CMC IaaS; or (v) Customer's failure to use reasonable security precautions. Furthermore, if CMC or its affiliates are obligated to respond to a third party subpoena or other compulsory legal order or process described in this Section 16.1, Customer shall also reimburse CMC for reasonable attorneys' fees and costs and shall pay CMC on a time and material basis for time and materials spent.

**16.2 CMC.** CMC shall indemnify, defend and hold harmless Customer and its affiliates, and each of its respective officers, directors, employees, agents, independent contractors, successors and assigns from and against liability for any third party claims based upon the CMC IaaS infringing or misappropriating any U.S. patent, copyright, or trademark of such third party. Notwithstanding the foregoing, in no event will CMC have any obligations or liability under this Section 16.2 arising from: (i) Customer's use of CMC IaaS in a modified, unauthorized or unintended form; (ii) Customer's violation of this Agreement; (iii) Customer's use of the non-current versions of the CMC IaaS; or (iv) any Customer Content.

**16.3 Process.** The indemnified party shall promptly notify the indemnifying party of any claim subject to this Section 16, but the indemnified party's failure to promptly notify the indemnifying party will only affect the indemnifying party's obligations under this Section 16 to the extent that the indemnified party's failure prejudices the indemnifying party's ability to defend the claim. The indemnifying party may: (i) use counsel of its choice (subject to the indemnified party's

written consent); and (ii) settle the claim as the indemnifying party deems appropriate, provided that the indemnifying party obtains the indemnified party's prior written consent before entering into any settlement. The indemnified party may also assume control of the defense and settlement of the claim.

Publically funded state institutions shall be liable for damages incurred by CMC, but shall not be required to also indemnify CMC to the extent applicable state laws expressly prohibit the institution from indemnifying CMC.

**17. DISPUTES; CHOICE OF LAW**

**17.1 Dispute Resolution.** The parties agree that prior to commencing any legal action, all disputes between them shall be submitted for informal resolution to their respective chief operating officers or his/her authorized designee with power to bind his/her respective company. The representatives shall meet within ten (10) days at a mutually agreeable location, but shall not be required to meet for more than two (2) business days; the timeline for performance of each party's obligations hereunder shall be tolled proportionately until, in accordance with the foregoing, the dispute is resolved or the parties stop meeting without having resolved such dispute. Provided, the foregoing process shall not require a party to delay obtaining any injunctive relief or equitable remedies based on a claim arising from the other party's breach of intellectual property, confidentiality or non-solicitation obligations.

**17.2 Jurisdiction; Venue.** The parties agree that no oral or written representation made during the course of any settlement discussions shall constitute a party admission. If the parties are still unable to reconcile their differences in accordance with the foregoing procedures, each party hereby agrees that any controversy or claim, whether based on contract, tort or other legal theory, arising out or relating to the Agreement, shall be maintained exclusively in the jurisdiction and venue of the courts sitting in and for Palm Beach County and the Southern District of Florida. The prevailing party shall be entitled to reimbursement of reasonable attorneys' fees and costs. The parties expressly waive right to trial by jury.

The foregoing choice of venue shall not apply to publically funded state institutions to the extent applicable state laws expressly prohibit the institution from litigating outside of its home state.

**17.3 Governing Law.** The Agreement shall be governed by and construed in accordance with the substantive laws of Florida, without regard to conflict of laws principles. The parties expressly opt out of the application of the UN Convention on the International Sale of Goods.

The foregoing choice of law shall not apply to publically funded state institutions to the extent applicable state laws expressly prohibit the institution from litigating under a foreign state law.

**18. ASSIGNMENT.** CMC hereby agrees it shall not withhold consent to Customer's assignment of the Agreement, in its entirety, in connection with the sale or acquisition of all or substantially all of the business assets or voting control, provided Customer and the assignee have fulfilled the following conditions prior to the transfer: (i) Customer shall provide written notice to CMC of the proposed assignment at least thirty (30) days prior to the date of such transaction; (ii) the assignee shall assume all liabilities under the Agreement and be bound to the Agreement; and (iii) Customer and assignee (if assignee is a CMC customer) shall not be in material breach of any agreement with CMC at the time of the transaction.

**19. NOTICES.** Notices sent to either party shall be effective when delivered in person or transmitted by fax machine with printed confirmation page (if delivered after 5:00 p.m. recipient's local time, then effective the next business day), one (1) business day after being sent by overnight courier, or two (2) business days after being sent by first class mail postage prepaid to the address on the first page hereof or such other address as a party may give notice in the same manner set forth in this Section 19.

**20. FORCE MAJEURE.** Neither party shall be liable for any delay in performing its obligations under the Agreement, if such delay is caused by circumstances beyond the party's reasonable control, including without limitation, any acts of God, war, terrorism, floods, windstorm, labor disputes, change in laws or regulations, public health risks or epidemics, or delay of essential materials or services. In the event a non-performance or a delay in performance of obligations under the Agreement is due to a force majeure event, the period of performance shall be extended by the delay due to such event and any additional time that the parties may mutually agree is necessary for the remobilization of personnel and resources. However, the party not affected by the force majeure shall have the right to terminate the Agreement without penalty if the party affected by the force majeure event is unable to resume full performance within thirty (30) days of occurrence of the event.

**21. INDEPENDENT CONTRACTOR STATUS; COMPLIANCE WITH LAW.** Each party and its personnel are independent contractors in relation to the other party with respect to all matters arising under the Agreement. Nothing herein shall be deemed to establish a partnership, joint venture, association or employment relationship between the parties. Each party shall remain responsible, and shall indemnify and hold harmless the other party, for the withholding and payment of all federal, state and local personal income, wage, earnings, occupation, social security, worker's compensation, unemployment, sickness and disability insurance taxes, payroll levies or employee benefit requirements (under ERISA, state law or otherwise) now existing or hereafter enacted and attributable to themselves and their respective personnel. Each party shall comply with all applicable federal and state laws, rules and regulations, in effect or hereafter established, applicable to discrimination and unfair employment practices.

Publicly funded state institutions shall be liable for damages incurred by CMC, but shall not be required to also indemnify CMC, to the extent applicable state laws expressly prohibit the institution from indemnifying CMC.

**22. AUDIT; COOPERATION.** CMC reserves the right to verify compliance with this Agreement. In the event of an audit, Customer shall provide information or other materials reasonably requested by CMC. CMC monitors the overall performance and stability of the CMC IaaS. Customer shall not block or interfere with this monitoring. In the event that CMC reasonably believes that a problem with the CMC IaaS may be attributable to Customer's use or Customer's Content, then Customer shall cooperate with CMC to identify the source of the problem.

**23. EXPORT LAWS.** Customer shall comply with all export and import laws and regulations of the United States and such other governments as are applicable. Customer hereby certifies that it will not directly or indirectly, export, re-export, or transship software or related information, or media in violation of United States laws and regulations.

**24. U.S. GOVERNMENT LICENSING.** With respect to the procurement of any CMC IaaS by or for the U.S.

Government, any software provided in connection with the CMC IaaS is commercial computer software. To the extent applicable, the use, duplication, or disclosure by the Government is subject to restrictions as set forth in the Agreement and are licensed with "Restricted Rights" as provided for in FAR 52.227-14, FAR 52.227-19(c), DFAR 252.227-7013, and other agency data rights provisions, as applicable. Customer is responsible for ensuring that copies are marked with a restricted rights notices and legends. CMC reserves all rights not expressly granted to Customer.

**25. PROMOTIONAL MATERIALS.** CMC may use Customer's name and reference the existence of the Agreement and ancillary agreements (without referencing detailed terms and pricing) in marketing materials and presentations.

**26. MISCELLANEOUS.** This Agreement constitutes the entire and exclusive agreement between the parties with respect to the subject matter hereof and supersede all prior and contemporaneous communications, whether written or oral. The Agreement may be modified or amended only by the mutual written agreement of the parties. In the event of a conflict between the Agreement and any term contained in an Exhibit or an Addendum, the following shall be the order of precedence: the Addendum, the Exhibit, the General Terms. Any provision hereof found by a tribunal of competent jurisdiction to be illegal or unenforceable shall be automatically conformed to the minimum requirements of law and all other provisions shall remain in full force and effect. Waiver of any provision hereof in one instance shall not preclude enforcement thereof on future occasions. Headings are for reference purposes only and have no substantive effect. The provisions which by their nature should apply beyond their terms will remain in force after any termination or expiration of this Agreement. Copies of the Agreement and notices generated in accordance herewith shall be treated as original documents admissible into evidence, unless a document's authenticity is genuinely placed into question. The Agreement may be executed in counterparts, each of which shall be deemed an original and together shall be deemed the entire Agreement.

**AGREED AND ACCEPTED** by the undersigned authorized representatives of the parties as of the date first set forth above.

**CUSTOMER**

By: \_\_\_\_\_  
Print: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

**CAMPUS MANAGEMENT CORP.**

By: \_\_\_\_\_  
Print: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

**EXHIBIT A**

**CAMPUSNET® IAAS TERM AND PRICING**

SAMPLE

**EXHIBIT B**

**CAMPUSNET® IAAS MICROSOFT® LICENSE COMPLIANCE**

SAMPLE

**EXHIBIT C**

**CAMPUSNET® IAAS SERVICE LEVEL AGREEMENT**

SAMPLE

**Item 6: Master Agreement**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.



# CAMPUS MANAGEMENT CORP. MASTER AGREEMENT

Effective Date: \_\_\_\_\_

<b>Customer Name:</b> _____ <b>Entity Type:</b> _____ <b>Address:</b> _____ <b>City, State, Zip:</b> _____ <b>Phone:</b> _____ <b>Fax:</b> _____	<b>Campus Management Corp.</b> <b>A Florida corporation</b> <b>777 Yamato Road, Suite 400</b> <b>Boca Raton, Florida 33431</b> <b>Phone: (561) 923-2500</b> <b>Fax: (561) 999-0096</b>
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**THIS MASTER AGREEMENT, SCHEDULES, EXHIBITS, AND ADDENDA**, as mutually executed from time-to-time and referenced in this master agreement (collectively, the "Agreement") is entered into between Campus Management Corp. ("CMC") and the party named above ("Customer") (CMC and Customer are sometimes collectively referred to as the "Parties" or individually as a "Party"). CMC provides, and Customer desires to acquire, certain software and services for higher learning institutions as further set forth herein.

CMC shall provide to Customer the software and services as set forth in the Agreement along with the Schedules and their respective Exhibits, and any applicable Addenda, mutually executed from time-to-time and incorporated herein by reference, as applicable:

- Schedule A: Software License
- Exhibit A-1: License Scope; Licensed Programs and Features
- Exhibit A-2: License Fees and Payment Terms
- Schedule B: CampusCare® Maintenance and Support
- Exhibit B-1: Description of Support Levels
- Exhibit B-2: Rate Schedule and Keys for CampusCare Standard and Premium Services
- Schedule C: CampusNet® Hosting Services
- Exhibit C-1: CampusNet Service Term, Pricing and Users
- Exhibit C-2: CampusNet Service Microsoft® License Compliance
- Exhibit C-3: Non-Production Environments
- Exhibit C-4: CampusNet Service Level Agreement
- Exhibit C-5: Data Sharing Policy

The general terms and conditions ("General Terms and Conditions") below apply to applicable software and services. Specific terms and conditions that apply only to certain software or services are contained in the applicable Schedules and Exhibits for such software or services. In the event of a conflict between the General Terms and Conditions and any term contained in a Schedule, Exhibit, and/or Addendum, the following shall be the order of precedence: the Addendum, the Exhibit, the Schedule and the General Terms and Conditions.

## GENERAL TERMS AND CONDITIONS

**1. DEFINITIONS.** The following capitalized terms shall have the meanings ascribed below and shall apply to the extent applicable to the relevant software and services acquired by Customer as referred to in the applicable Schedules and Exhibits.

**"Addendum"** means a mutually executed addendum which amends the Agreement and is incorporated herein by reference.

**"Ancillary Programs"** means the third party software delivered with the Licensed Program (as defined below) and any related documentation.

**"API"** means certain CampusLink<sup>SM</sup> application programming interfaces, including but not limited to AppCreator, Communicator, eLead, eLearning, Merchant and Registration, as applicable.

**"Campus"** means a unique identification code used for each Record Count group contained in a database.

**"CMC Proprietary Materials"** means, collectively, APIs, Licensed Program (as defined below), Documentation (as defined below), Deliverables (as defined below), services and any other system or technology (excluding Customer Proprietary Materials) used by CMC or its affiliates including, without limitation, any related

communications/integration designed, developed or implemented by CMC or its affiliates, and all technology, software, source code, object code, scripts, hardware, processes, algorithms, user interfaces, application interfaces, proprietary elements, records, materials, designs, plans, techniques, methods, inventions, forms, formulas, components, compilations, and other works of authorship, and other trade secrets or know-how related to any of the foregoing, including but not limited to all copyrights, trademarks, patents, trade secrets and other intellectual property rights inherent therein or appurtenant thereto, and any extracts, derivatives, modifications, enhancements, updates and upgrades thereto owned by CMC, its affiliates, or its licensors as of the Effective Date or thereafter created, designed, or developed by CMC, its affiliates, or licensors.

**“Computer Infrastructure”** means all computers, networks, printers, operating systems, and telecommunications systems used by Customer in the operation of the Licensed Program.

**“Customer Data”** means all electronic data or information submitted by Customer or its Users (as defined below) or constituents.

**“Customer Proprietary Materials”** means Customer Data, all Customer Confidential Information (as defined in Section 6.1) and any proprietary software, hardware, records or materials owned or licensed by Customer (except for CMC Proprietary Materials).

**“Deliverables”** means all CMC work product, including without limitation, software, analyses, discoveries, designs, routines, scripts, methodologies, techniques, documentation, training manuals, and any fixes, Releases (as defined below), Enhancements (as defined below) or derivative works of the foregoing.

**“Documentation”** means the Licensed Program user guides, reference manuals, job aides, and installation materials provided by CMC to Customer hereunder.

**“Effective Date”** means the date as set forth above, unless otherwise specifically referenced in any subsequent applicable Schedule or Exhibit.

**“Enhancement”** means any modification or addition that, when made or added to the Licensed Program, changes its utility, efficiency, functional capability, or application.

**“Error”** means any failure of the Licensed Program to substantially conform in all material respects to the functional specifications of the Documentation. However, any nonconformity arising from Customer's data, or Customer's misuse, alteration, damage or configuration of the Licensed Program, or Customer's combining or using the Licensed Program with any hardware, network or software not supplied or identified by CMC as compatible, shall not be considered an Error.

**“Error Correction”** means a modification or addition that, when made or added to the Licensed Program, establishes substantial conformity in all material respects to the functional specifications of the Documentation, or a procedure or routine that, when observed in the regular operation of the Licensed Program, resolves the adverse effects of an Error.

**“Exhibit”** means any attachment to a Schedule, which shall be ordered alphabetically and sequentially (e.g., Exhibit A-1, Exhibit A-2, Exhibit B-1, Exhibit B-2, Exhibit C-1, Exhibit C-2).

**“Go-Live”** means when the Licensed Program is first used by Customer in a live environment.

**“License Fees”** means the fees due to CMC for the Licensed Program, in accordance with the terms of Exhibit A-2 hereto.

**“Licensed Program”** means the object code version of CMC's commercially available software expressly identified in Exhibit A-1 hereto. The term shall also include subsequent Releases delivered to Customer pursuant to CampusCare Services (as defined in Schedule B) between the Parties.

**“License Scope”** means, to the extent applicable, the Licensed Program, Record Count, Campuses, Users and other license grant details set forth in Exhibit A-1 attached hereto.

**“Policies”** means CMC's written policies to the extent applicable (e.g., Acceptable Use Policy, E-mail and Anti-Spam Policies), all of which are posted on the CMC web site at <http://www.campusmanagement.com/EN-US/aboutUs/Pages/CampusNet.aspx>, as may be updated from time-to-time.

**“Record Count”** means the number of Active Student Records or Full Time Equivalent students enrolled, as identified in Exhibit A-1 hereto.

**“Releases”** means new versions of the Licensed Program, which may include Error Corrections and/or Enhancements.

**“Schedule”** means any attachment to the General Terms and Conditions, which shall be ordered alphabetically (e.g., Schedule A, Schedule B, Schedule C).

**“Source Code”** means those statements in a computer language, which when processed by a compiler, assembler or interpreter, become executable by a computer.

**“Supported System”** means the minimum hardware, servers, workstations, platform and software that are required for Customer to obtain, install and maintain in order for the Licensed Program to operate properly.

**“Supported Environment”** means the deployment of Licensed Programs on the hardware and operating systems that are specified in the then current Documentation (i.e., Customer's “live environment” or “production environment”).

**“Third Party Products”** means products used by Customer in conjunction with the Licensed Program, but not licensed or provided by CMC as part of the Licensed Program, including, but not limited to, Microsoft Great Plains Accounting, Crystal Reports, Foxfire Report Writer, QuickTouch Point-of-Sale, Scantron, PVI ImageNow, Microsoft SQL Server, Citrix Metaframe, Microsoft Terminal Server, Microsoft operating systems, and Microsoft Office.

**“User”** means the concurrent or named users, if applicable.

## 2. FEES, PAYMENTS AND TAXES.

2.1 Fees. Fees for software and services (other than Professional Services, as defined in Section 5 below) are set forth in the applicable Schedule.

2.2 Invoices. Invoices for software and services (other than Professional Services) are set forth in the applicable Schedule.

2.3 Restrictions on Price Increases. CMC may increase its rates for the same software and services contracted hereunder by up to three percent (3%) over the percentage increase of the U.S. Department of Labor Consumer Price Index for Urban Wage Earners and Clerical Workers, all Cities, per annum, calculated on an average annual basis over the applicable term.

2.4 Billing Adjustments. Customer grants CMC the right to conduct an annual review of Customer's usage, and Customer will cooperate with CMC's reasonable requests and provide access to its systems and records in connection therewith. Customer is responsible for promptly notifying CMC of any additions or deletions of Users. Provided, no adjustment in fees shall be made for any decrease in the number of Users.

2.5 Out-of-Pocket Costs. Except as otherwise may be expressly set forth in the Agreement, prices quoted for services do not include travel and out-of-pocket expenses. Customer shall reimburse CMC for its reasonable expenses, including, without limitation, costs of travel (air and cab fare, lodging, auto rental or local mileage, standard per diem, etc., based on M&I standard U.S. Government per diem rates, and subject to any other guidelines mutually agreed upon by both Parties) and reasonable out-of-pocket costs for photocopying, overnight courier, and the like (collectively, "Travel and Expenses"). CMC will maintain records of Travel and Expenses, and upon Customer's reasonable request, CMC will provide copies of hotel and airfare records. CMC's Professional Services Travel Policy and Expense Guidelines is posted on the CMC web site at <http://www.campusmanagement.com/EN-US/aboutUs/Pages/TravelPolicy.aspx>, as may be amended from time to time.

2.6 Late Fees. Any amount invoiced under this Section 2 and not paid in full as required herein shall bear interest at the lesser of 1.5% per month or the highest rate allowed by applicable law, and shall be subject to reasonable costs and attorney's fees related to collection. Upon written notice, CMC reserves the right to suspend any or all services to delinquent accounts until such time as the account is brought current and Customer agrees to hold CMC harmless for any interruption of services arising from any payment delay. Furthermore, if License Fees are payable in installments, Customer acknowledges and agrees that in the event Customer fails to make a timely payment for License Fees, other than caused by termination of the Agreement due to CMC's uncured material breach, CMC shall retain all payments.

2.7 Taxes. Customer shall promptly pay, indemnify and hold CMC harmless from all sales, use, gross receipts, GST, value-added, personal property or other tax or levy (including interest and penalties) imposed on any services, Licensed Program and Deliverables which have been or will be provided, other than taxes on the net income or profits of CMC. Subject to any applicable laws, the

foregoing shall not apply to the extent Customer is formed as a not-for-profit or publicly funded state organization and promptly provides CMC an applicable tax exempt certificate. All prices quoted are net of taxes.

2.8 Disputed Invoices; Allocation of Payments. Customer may withhold any invoiced line item amounts due hereunder if it, in good faith, disputes the item in a detailed writing within twenty (20) days of receipt of the invoice and promptly pays the undisputed amounts. CMC reserves the right to cease work without prejudice if undisputed amounts are not paid within thirty (30) days after the date of the invoice. CMC may allocate payments received to fees and expenses in its sole discretion and Customer's communications on or with payments shall not be construed as a novation.

3. **TERM**. The term for software and services (other than Professional Services) shall be as set forth in the applicable Schedule.

## 4. TERMINATION.

### 4.1 Termination.

(a) Customer. Customer may terminate:

(i) the Agreement in the event CMC materially breaches its obligations under the Agreement and fails to cure such breach within ten (10) days in the case of a breach of the confidentiality provisions hereunder, and thirty (30) days otherwise, after receipt of written notice from Customer;

(ii) a Schedule in the event CMC materially breaches its obligations under such Schedule, or a Statement of Work (as defined in Section 5.1 below) in the event CMC materially breaches its obligations under such Statement of Work, as applicable, and fails to cure such breach within ten (10) days in the case of a breach of the confidentiality provisions hereunder, and thirty (30) days otherwise, after receipt of written notice from Customer; or

(iii) a time and materials Statement of Work upon not less than fifteen (15) days notice, subject to Section 5.7 below, unless otherwise stated in the Statement of Work.

(b) CMC. CMC may terminate:

(i) the Agreement in the event Customer materially breaches its obligations under the Agreement and fails to cure such breach within ten (10) days in the case of a breach of the confidentiality or intellectual property provisions hereunder, and thirty (30) days otherwise, after receipt of written notice from CMC;

(ii) a Schedule or Statement of Work in the event Customer materially breaches its payment obligations hereunder or a Schedule in the event Customer materially breaches its obligations under such Schedule or a Statement of Work in the event Customer materially breaches its obligations under such Statement of Work, as applicable, and fails to cure such breach within ten (10) days in the case of a breach of the confidentiality or intellectual property provisions hereunder, and thirty (30) days otherwise, after receipt of written notice from CMC.

(c) Bankruptcy. Either Party may terminate this Agreement, if the other Party becomes insolvent, makes an

assignment for the benefit of its creditors, a receiver is appointed or a petition in bankruptcy is filed with respect to the Party and is not dismissed within sixty (60) days. Furthermore, the Parties acknowledge and agree that this Agreement is for the license of intellectual property that is subject to Bankruptcy Code Section 365(n), and that Customer shall be entitled to all rights applicable thereunder in the event of a bankruptcy of CMC.

#### 4.2 Effects of Termination.

(a) Agreement. The termination of the Agreement shall serve to terminate all existing Schedules and Statements of Work, unless otherwise agreed to in writing by the Parties. Upon termination of the Agreement, Customer's right to use and possess CMC Proprietary Materials shall immediately cease, become void, lapse and be of no further force and effect. Customer shall promptly return all copies to CMC, except that CMC may otherwise direct Customer to delete all installed copies off of any and all storage media. Customer shall provide CMC with written certification signed by an officer of Customer that all copies of CMC Proprietary Materials have been returned or destroyed and that Customer has retained no copies.

(b) Schedule or Statement of Work. Unless otherwise provided, termination or expiration of a Schedule or Statement of Work shall not operate to terminate the Agreement or any other Schedule or Statement of Work.

4.3 Accrued but Unpaid Fees. Following termination of services (i.e., any Schedule or Statement of Work), CMC shall immediately invoice Customer for all accrued but unpaid fees and charges and all reimbursable expenses, and Customer shall pay the invoiced amount immediately upon receipt of such invoice. Unless the Agreement terminates as a result of Customer's non-payment or uncured material breach, Customer may continue to use any work supplied thereunder to Customer by CMC for the remaining Software License Term (defined in Schedule A) of the Licensed Program.

4.4 Delay. CMC's ability to deliver the services depends upon Customer's full and timely cooperation, dedication of skilled resources, as well as the accuracy and completeness of any information Customer provides. In the event of failure of any of the foregoing or Customer's delay or non-performance of any obligation under the Agreement causes a delay in CMC's performance of its obligation hereunder which reasonably relies on Customer's timely cooperation and performance, the period of time for CMC's performance shall be extended proportionately and additional costs may be incurred by Customer. Additionally, if any assumptions change or are inaccurate, then the scope of services, duration and costs may change. Provided, the foregoing shall not be construed to require CMC to waive any breach by Customer.

**5. TERMS AND CONDITIONS APPLICABLE TO PROFESSIONAL SERVICES.** The terms and conditions set forth in this Section 5 shall apply to implementation of Licensed Program(s) and/or other services mutually agreed upon from time-to-time ("Professional Services").

5.1 Time and Material Basis. Unless otherwise set forth in a statement of work ("Statement of Work"), CMC is hired on a time and materials basis to perform the Professional Services and provide Deliverables.

5.2 Summary of Services. Unless otherwise stated, all work schedules of a Statement of Work shall be considered reasonably accurate estimates, subject to revision. For time and materials work, CMC shall maintain daily time records of hours and tasks performed, a summary of which shall accompany invoices which are submitted to Customer. CMC's standard work days are Monday through Friday, excluding holidays. All services provided by CMC during non-standard hours shall be governed by CMC's Policy for Non-Standard Hours, which is posted at <http://www.campusmanagement.com/EN-US/aboutUs/Pages/NonStandardBusinessHours.aspx>. CMC shall not perform any Professional Services during non-standard hours, without the prior consent of Customer. In the event of a conflict between terms of an executed Project Plan or Statement of Work and this Agreement, the terms of the Project Plan or Statement of Work, as applicable, shall control with respect to such project, and an executed Change Order shall take precedence over the Statement of Work.

5.3 Change Orders; Assumptions. Either Party may initiate a change to the Statement of Work by proposing in writing details of such change. The other Party shall promptly respond to any proposed changes. Both Parties shall work together to identify any schedule or price increase resulting from the change. If the Parties are mutually agreeable to any changes to the Statement of Work, then they shall enter into a mutual written change order executed by officers of both Parties ("Change Order"). Customer acknowledges that any additional changes to the assumptions in the Statement of Work may affect time and/or costs.

5.4 Fees. Customer shall pay either (i) hourly rates, as set forth in the non-binding estimate of labor costs (the "Estimated Fees") or (ii) fixed fees ("Fixed Fees") to complete the Professional Services as set forth in the Statement of Work. Any rate increases, as set forth in Section 2.3 hereof, during the period of performance of a Statement of Work shall not increase the rates applicable to the Professional Services set forth in such Statement of Work.

5.5 Invoice. CMC shall invoice Customer for Professional Services as set forth in the Statement of Work. Unless otherwise stated in writing, Professional Services and Travel and Expenses shall be invoiced and Customer shall pay CMC within thirty (30) days of the date of invoice.

5.6 Term. From time-to-time the parties shall enter into a Statement of Work, which terms shall apply along with the terms of this Section 5 ("Professional Services Term"). Termination shall have no effect on Customer's obligation to pay the applicable fees and charges for Professional Services that are rendered through the effective date of termination.

5.7 Cancellations. Customer acknowledges that CMC allocates its resources to provide Professional Services to Customer. In the event Customer cancels any scheduled Professional Services with less than fifteen (15) days prior written notice to CMC, and CMC cannot after using good faith efforts reallocate its resources, then Customer shall promptly pay CMC the amount of lost fees (based on the difference between the projected scheduled services for Customer and the fees actually received) and any out-of-pocket expenses actually incurred by CMC.

## 6. CONFIDENTIAL INFORMATION.

6.1 Confidential Information. Neither Party nor any third party acting on its behalf will for any reason at any time use or disclose any proprietary information of the other Party, including, without limitation, relating to the processes, techniques, work practices, customers, prospective customers, suppliers, vendors, business practices, strategies, business plans, financial information, marketing, third party licenses, products, proprietary rights or trade secrets of the other Party (collectively the "Confidential Information"). In addition, the Parties acknowledge and agree that (i) the Licensed Program and related materials, know-how and proprietary rights and Enhancements, Error Corrections, Releases and information provided in the course of performing CampusCare Services shall be deemed CMC's Confidential Information, and (ii) the proprietary data for each Campus, including, but not limited to, student records, financial data, and personnel records, shall be deemed Customer's Confidential Information. Each Party shall use at least the same degree of care in safeguarding the other Party's Confidential Information as it uses in safeguarding its own Confidential Information, but not less than due diligence and care, to prevent the theft, disclosure, copying, reproduction, distribution and preparation of derivative works of the other Party's Confidential Information. Either Party may disclose Confidential Information to its employees, independent contractors and advisors that have a need to know in the course of their assigned duties and responsibilities in connection with the Agreement, provided such parties are bound by legally binding obligations to protect such Confidential Information in a manner consistent with the Agreement. The Parties acknowledge that CMC may be required to use or apply Customer's Confidential Information as reasonably required in order to perform under the Agreement, and CMC may retain and use residual knowledge (i.e., information retained in the unaided memory of personnel) provided CMC does not disclose any of Customer's Confidential Information.

6.2 Exceptions. Confidential Information does not include (i) information already known or independently developed by the recipient without use or reliance on the other Party's Confidential Information, as evidenced by records, (ii) information in the public domain through no wrongful act of the recipient, or (iii) information received from a third party who was not under a duty of non-disclosure.

6.3 Disclosure Required by Law. If one Party (the "Receiving Party") is required by a lawful order from any court or agency of competent jurisdiction to disclose Confidential Information of the other Party ("Disclosing Party"), the Receiving Party shall promptly notify the Disclosing Party of such order so that the Disclosing Party may take reasonable steps to limit further disclosure, including obtaining a protective order or other reasonable assurance that confidential treatment will be accorded to the Confidential Information. If, in the absence of a protective order, the Receiving Party is compelled as a matter of law to disclose Confidential Information, the Receiving Party will use reasonable efforts to disclose only the Confidential Information that is required by law to be disclosed.

With respect to publically funded state institutions, CMC acknowledges that certain information and documents may be subject to public records laws, and Customer shall provide CMC an opportunity to review and object to disclosure (including obtaining a protective order) pursuant to state law.

6.4 Remedies. Confidential Information shall remain the sole property of the Disclosing Party or its respective licensor. In the event of a breach or threatened breach of this provision, the Disclosing Party shall be entitled to obtain preliminary injunctive relief, without posting bond, to prevent the use and disclosure of such Confidential Information, in addition to all other remedies available at law and in equity.

## 7. WARRANTIES.

7.1 CMC's Limited Warranties. CMC represents, warrants and covenants that:

(a) CMC has authority to enter into the Agreement and to grant the rights and licenses set forth herein.

(b) Neither its entering into nor its performance of the Agreement conflicts with or creates a breach of any contract or obligation to which it is bound.

(c) CMC shall (i) perform all Professional Services in a professional and workmanlike manner, (ii) the Professional Services and Deliverables shall substantially conform in all material respect to the Statement of Work and Documentation, and (iii) the Deliverables in the form of media delivered to Customer are free from defects in materials and workmanship.

(d) CMC, in the operation of its business, shall remain at all times during the Agreement in compliance in all material respect with applicable federal, state and local laws, including, without limitation, all applicable U.S. Department of Education rules and regulations. Furthermore, CMC will employ data security standards that a similarly situated and reasonably prudent services provider in the same industry would provide under like circumstances designed to comply in all material respects with applicable laws regarding confidentiality and safeguarding of personal information, including student data and financial information, if any.

(e) From the date of delivery of the relevant Licensed Program and continuing for a period of ninety (90) days commencing from the date of Go-Live, such Licensed Program will perform on the Supported System in all material respects in substantial conformance with the Documentation.

(f) The Licensed Program will not at any time contain computer viruses, worms, trap doors, time bombs, undocumented passwords, disabling code (which renders Licensed Program unusable until a patch or new password is provided), or any similar mechanism or device. Notwithstanding the above, Customer acknowledges the Licensed Program contains code and enabling keys to ensure conformance to the Record Count licensing restrictions as set forth in Exhibit A-1 hereto and any applicable Addenda.

7.2 Customer's Limited Warranties. Customer represents, warrants and covenants that:

(a) Customer has authority to enter into and perform in accordance with the provisions of the Agreement.

(b) Neither its entering into nor its performance of the Agreement conflicts with or creates a breach of any contract or obligation to which it is bound.

(c) Customer, in the operation of its business, shall remain at all times during the Agreement in compliance in all material respects with applicable federal, state and local laws, including, without limitation, all applicable U.S. Department of Education rules and regulations.

**8. DISCLAIMER OF WARRANTIES.** EACH PARTY HEREBY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, OR FITNESS FOR A PARTICULAR PURPOSE. CMC DOES NOT WARRANT THAT THE LICENSED PROGRAM, SERVICES, DELIVERABLES, ERROR CORRECTIONS, ENHANCEMENTS AND RELEASES WILL BE ERROR-FREE OR OPERATE WITHOUT INTERRUPTION. EXCEPT TO THE EXTENT CMC PROVIDES THE HOSTING SERVICES FOR THE LICENSED PROGRAM, CUSTOMER IS SOLELY RESPONSIBLE FOR OBTAINING AND MAINTAINING SYSTEMS NECESSARY FOR HOSTING AND ACCESSING THE LICENSED PROGRAM AND ASSOCIATED DATA, AND FOR STORING, TRANSFERRING AND HANDLING DATA IN COMPLIANCE WITH LAWS. FOR HOSTING SERVICES, CMC OR ITS AFFILIATES DO NOT HAVE ANY DUTY TO REVIEW, EDIT, SCREEN, PUBLISH OR REMOVE ANY CUSTOMER DATA OR USER CONTENT EXCEPT AS STRICTLY REQUIRED BY APPLICABLE LAW.

**9. LIMITATION OF LIABILITY.**

9.1 LIMITATIONS. EXCEPT FOR THE OBLIGATIONS HEREIN TO INDEMNIFY AGAINST THIRD PARTY CLAIMS OR BREACH OF INTELLECTUAL PROPERTY RIGHTS, IN NO EVENT SHALL EITHER PARTY OR ITS AFFILIATES BE LIABLE, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES (INCLUDING LOST SAVINGS, PROFIT OR BUSINESS INTERRUPTION EVEN IF NOTIFIED IN ADVANCE OF SUCH POSSIBILITY) ARISING OUT OF OR PERTAINING TO THE SUBJECT MATTER OF THIS AGREEMENT. IN ADDITION, EXCEPT WITH RESPECT TO A WILLFUL BREACH, A BREACH OF THE CONFIDENTIALITY OR INTELLECTUAL PROPERTY PROVISIONS OR THE OBLIGATION TO INDEMNIFY FOR THIRD PARTY DAMAGES AS PROVIDED HEREUNDER, THE FOLLOWING SHALL APPLY:

FOR LICENSED PROGRAMS. NEITHER PARTY NOR ITS AFFILIATES SHALL BE LIABLE FOR DAMAGES IN EXCESS OF THE TOTAL LICENSE FEES PAID FOR THE UNUSED PORTION OF THE RELEVANT LICENSED PROGRAM BASED ON A SEVEN YEAR STRAIGHT-LINE AMORTIZATION SCHEDULE.

FOR PROFESSIONAL SERVICES. NEITHER PARTY NOR ITS AFFILIATES SHALL BE LIABLE TO THE OTHER PARTY FOR DAMAGES IN EXCESS OF THE TOTAL AMOUNT PAYABLE FOR SERVICES PURSUANT TO THE APPLICABLE STATEMENT OF WORK.

FOR SERVICES OTHER THAN PROFESSIONAL SERVICES (E.G., CAMPUSCARE SERVICES, CAMPUSNET

SERVICES, OTHER). NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR DAMAGES IN EXCESS OF THE TOTAL AMOUNT PAID FOR SERVICES DURING THE TWELVE MONTH PERIOD IMMEDIATELY PRECEDING THE DATE ANY SUCH CAUSE OF ACTION AROSE.

THE FOREGOING LIMITATIONS OF LIABILITY SHALL NOT BE CONSTRUED TO LIMIT CUSTOMER'S OBLIGATION TO PAY LICENSE FEES, SERVICE FEES AND EXPENSES, AS APPLICABLE, IN THE EVENT OF TERMINATION ARISING FROM CUSTOMER'S BREACH.

The foregoing limitation of liability shall not be construed as an express or implied waiver by a publically funded state institution of its governmental immunity or as an express or implied acceptance by the institution of liabilities arising as a result of actions which lie in tort or could lie in tort in excess of the liabilities allowed under applicable state law.

9.2 Limitation Period. No action, whether based in contract, strict liability, or tort, including any action based on negligence, arising out of the performance of any services under the Agreement, may be brought by either Party more than two (2) years after such cause of action began to accrue.

**10. LIMITATION OF REMEDIES.** Except with respect to CMC's and its affiliates' obligations to indemnify against third party damages for intellectual property infringement claims and as otherwise provided herein, CMC's obligation and Customer's exclusive remedies for CMC's or its affiliates' uncured material breach of the Agreement arising from defective Licensed Programs, services or Deliverables shall be (i) to obtain the repair, replacement or correction of the defective Licensed Program, service or Deliverable to the extent warranted under Section 7.1 above or, (ii) if CMC reasonably determines that such remedy is not economically or technically feasible with respect to Licensed Programs or Deliverable, to terminate the Agreement and obtain a refund of amounts paid for the unused portion of the defective Licensed Program or Deliverable based on a seven year straight-line amortization schedule. CMC shall have no obligation under this Section 10 for issues arising from Customer's misuse or modification of software, Customer's failure to comply with CMC's reasonable policies regarding support and services, or Customer's use of consultants or service providers who are not certified or expressly authorized by CMC in advance.

**11. INDEPENDENT CONTRACTOR STATUS; COMPLIANCE WITH LAW.** Each Party and its personnel are independent contractors in relation to the other Party with respect to all matters arising under the Agreement. Nothing herein shall be deemed to establish a partnership, joint venture, association or employment relationship between the Parties. Each Party shall remain responsible, and shall indemnify and hold harmless the other Party, for the withholding and payment of all federal, state and local personal income, wage, earnings, occupation, social security, worker's compensation, unemployment, sickness and disability insurance taxes, payroll levies or employee benefit requirements (under ERISA, state law or otherwise) now existing or hereafter enacted and attributable to themselves and their respective personnel. Each Party shall comply with all applicable federal and state laws, rules and regulations, in effect or hereafter established, applicable to discrimination and unfair employment practices. Publically funded state institutions shall be

liable for damages incurred by CMC, but shall not be required to also indemnify CMC, to the extent applicable state laws expressly prohibit the institution from indemnifying CMC.

**12. FORCE MAJEURE.** Neither Party shall be liable for any delay in performing its obligations under the Agreement, if such delay is caused by circumstances beyond the Party's reasonable control, including without limitation, any acts of God, war, terrorism, floods, windstorm, labor disputes, change in laws or regulations, public health risks or epidemics, or delay of essential materials or services. In the event a non-performance or a delay in performance of obligations under the Agreement is due to a force majeure event, the period of performance shall be extended by the delay due to such event and any additional time that the Parties may mutually agree is necessary for the remobilization of personnel and resources. However, the Party not affected by the force majeure shall have the right to terminate the Agreement without penalty if the Party affected by the force majeure event is unable to resume full performance within thirty (30) days of occurrence of the event.

**13. ASSIGNMENT.** CMC hereby agrees it shall not withhold consent to Customer's assignment of the Agreement, in its entirety, in connection with the sale or acquisition of Customer of all or substantially all of the business assets or voting control, provided Customer and the assignee have fulfilled the following conditions prior to the transfer: (i) Customer shall provide written notice to CMC of the proposed assignment at least thirty (30) days prior to the date of such transaction; (ii) the assignee shall assume all liabilities under the Agreement and be bound to the Agreement; and (iii) Customer and assignee (if assignee is a CMC-Customer) shall not be in material breach of any agreement with CMC at the time of the transaction.

**14. NOTICES.** Notices sent to either Party shall be effective when delivered in person or transmitted by fax machine with printed confirmation page (if delivered after 5:00 p.m. recipient's local time, then effective the next business day), one (1) business day after being sent by overnight courier, or two (2) business days after being sent by first class mail postage prepaid to the address on the first page hereof or such other address as a Party may give notice in the same manner set forth in this Section 14.

**15. DISPUTES; CHOICE OF LAW.**

**15.1 Dispute Resolution.** The Parties agree that prior to commencing any legal action, all disputes between them shall be submitted for informal resolution to their respective chief operating officers or his/her authorized designee with power to bind his/her respective company. The representatives shall meet within ten (10) days at a mutually agreeable location, but shall not be required to meet for more than two (2) business days; the timeline for performance of each Party's obligations hereunder shall be tolled proportionately until, in accordance with the foregoing, the dispute is resolved or the Parties stop meeting without having resolved such dispute. Provided, the foregoing process shall not require a Party to delay obtaining any injunctive relief or equitable remedies based on a claim arising from the other Party's breach of intellectual property, confidentiality or non-solicitation obligations.

**15.2 Jurisdiction; Venue.** The Parties agree that no oral or written representation made during the course of any settlement discussions shall constitute a Party admission. If the Parties are still

unable to reconcile their differences in accordance with the foregoing procedures, each Party hereby agrees that any controversy or claim, whether based on contract, tort or other legal theory, arising out or relating to the Agreement, shall be maintained exclusively in the jurisdiction and venue of the courts sitting in and for Palm Beach County and the Southern District of Florida. The prevailing Party shall be entitled to reimbursement of reasonable attorneys' fees and costs. The Parties expressly waive right to trial by jury.

The foregoing choice of venue shall not apply to publically funded state institutions to the extent applicable state laws expressly prohibit the institution from litigating outside of its home state.

**15.3 Governing Law.** The Agreement shall be governed by and construed in accordance with the substantive laws of Florida, without regard to conflict of laws principles. The Parties expressly opt out of the application of the UN Convention on the International Sale of Goods.

The foregoing choice of law shall not apply to publically funded state institutions to the extent applicable state laws expressly prohibit the institution from litigating under a foreign state law.

**16. INSURANCE; INDEMNITY.**

**16.1 Insurance.** Each Party shall maintain adequate insurance protection covering its respective activities hereunder, including coverage for statutory worker's compensation, comprehensive general liability for bodily injury and tangible property damage, as well as adequate coverage for vehicles.

**16.2 Indemnification.** Each Party (the "Indemnifying Party") shall indemnify, defend and hold harmless the other Party and its affiliates, and each of its respective officers, directors, employees, agents, independent contractors, successors and assigns (collectively the "Indemnified Party") from and against liability for third party claims based on (i) intellectual property infringement or (ii) bodily injury, death and tangible property damage resulting from the grossly negligent or willful acts or omissions of its officers, agents, employees or representatives acting within the scope of their work. The Indemnifying Party shall defend, indemnify and hold harmless the Indemnified Party against the claim at the Indemnifying Party's expense and pay all costs, damages, and attorney's fees that a court awards, provided that the Indemnified Party:

(a) promptly notifies the Indemnifying Party in writing of the claim or the possibility thereof, and for infringement claims, Indemnified Party shall cooperate with Indemnifying Party to cease using the infringing product to the extent commercially practical or if CMC provides a reasonable temporary solution;

(b) allows the Indemnifying Party sole control of the settlement, compromise, negotiation, and defense of any such action, provided Indemnifying Party shall provide Indemnified Party prior written consent if settlement or compromise requires Indemnified Party to cease using the Licensed Program; and

(c) cooperates in good faith with the Indemnifying Party in the defense and any related settlement negotiations (provided the Indemnifying Party shall not settle the dispute without the Indemnified Party's written consent, unless the Indemnifying Party obtains a

general release in favor of the Indemnified Party). Nothing herein shall restrict the Indemnified Party from participating in the defense through counsel reasonably acceptable to the Indemnifying Party at its own cost and expense. Publically funded state institutions shall be liable for damages incurred by CMC, but shall not be required to also indemnify CMC to the extent applicable state laws expressly prohibit the institution from indemnifying CMC.

**16.3 Limitations on Indemnity Obligations.** The foregoing indemnity shall not apply to any claim that arises from: (i) modification of the Licensed Program by anyone other than CMC, its affiliates, or its authorized contractor; (ii) Customer's use of the Licensed Program in conjunction with Customer software not authorized by CMC where use with such software gave rise to the claim; (iii) Customer's use of the Licensed Program in a manner in violation of the Agreement; or (iv) use of other than the most current, unaltered patch, update or upgrade to the Licensed Program available from CMC, if such claim would have been avoided by Customer's use of such patch, update or upgrade.

**16.4 Remedies for Intellectual Property Infringement.** If use of the Licensed Program is enjoined or if CMC reasonably believes that use of the Licensed Program may be enjoined, CMC may, at its option, (i) obtain the right for Customer to continue using the Licensed Program; or (ii) replace or modify the Licensed Program so it is no longer infringing, or if CMC determines that neither (i) nor (ii) can reasonably be accomplished, (iii) terminate the applicable license(s) and issue a pro rata refund of the License Fees paid for the unused portion of the Licensed Program based on a seven-year straight-line amortization schedule. The foregoing shall constitute Customer's sole and exclusive remedy for all claims relating to infringement.

## 17. CHANGES.

**17.1 Addendum.** Customer may request to expand the license to the relevant Licensed Program, or either Party may request to expand the scope of services, by delivering a written request and entering into a mutually executed Addendum or Change Order, as applicable.

**17.2 Adjustments.** Customer understands and acknowledges that CMC reserves the right to increase fees for future Users, Record Count, Campuses, Licensed Programs, and/or services ordered after the Effective Date.

## 18. INTELLECTUAL PROPERTY.

**18.1 Restrictions.** Customer shall not (i) modify, copy or create derivative works based on the CMC Proprietary Materials or services; or (ii) disassemble, reverse engineer, or decompile the CMC Proprietary Materials or services, or access the CMC Proprietary Materials or services in order to (a) build a competitive product or service, (b) build a product or service using similar ideas, features, functions or graphics of the CMC Proprietary Materials or services, or (c) copy any ideas, features, functions or graphics of the CMC Proprietary Materials or services. CMC shall have a royalty-free, worldwide, perpetual license to use or incorporate into the CMC Proprietary Materials or services any suggestions, ideas, enhancement requests, feedback, recommendations or other information provided by Customer or its Users relating to the operation of the CMC Proprietary Materials or services.

**18.2 CMC Proprietary Materials.** CMC Proprietary Materials shall remain the sole and exclusive property of CMC and its affiliates, even if Customer, its employees, or contractors may have contributed to or joined in the invention or development of CMC Proprietary Materials and CMC shall exclusively own and retain all right, title and interest in and to the foregoing under copyright, trade secret, trademark, patent and other intellectual property laws. Customer shall execute any further instruments that CMC reasonably requests from time-to-time for purposes of perfecting CMC's ownership rights.

**18.3 Trademarks and Copyrights.** The Licensed Program may also include Ancillary Programs, in which third parties retain trademark, copyright and other proprietary rights. Campus Management Corp<sup>®</sup>, Campus Management<sup>SM</sup>, CampusCare<sup>®</sup>, CampusLink<sup>SM</sup>, CampusNet<sup>®</sup>, CampusNexus<sup>TM</sup>, CampusVue<sup>®</sup>, Talisma<sup>®</sup> and related marks are trademarks or servicemarks of CMC, and CMC retains all right, title and interest therein.

**18.4 CMC Programs.** To the extent that CMC may provide Customer with any Error Corrections or Enhancements (collectively, "CMC Programs"), Customer may install, use and make back-up copies of the CMC Programs strictly in accordance with the license grant. All restrictions to the Licensed Program, and all remedies regarding infringement, apply to the CMC Programs. Any rights not expressly granted herein are reserved to CMC.

**18.5 Customer Proprietary Materials.** Customer Proprietary Materials shall remain the property of Customer, and CMC will have no rights therein, except as may be required for CMC to perform its obligations hereunder or as may be provided in other written agreement(s) entered into between the Parties.

**18.6 Reports and Integration Code.** The Parties acknowledge and agree that (a) customized reports containing data and business process analysis and (b) custom integration code developed under a Statement of Work between CMC and Customer shall be the property of Customer for use solely in connection with its internal business operations and not for resale or license. Except for such custom integration code, no rights are transferred with respect to CMC packaged integration services, frameworks, and APIs. For clarification, subject to obligations regarding Customer Confidential Information, nothing shall restrict CMC from using substantially similar code when performing integration services for other customers.

**18.7 Customer Owned Deliverables.** The Parties acknowledge and agree that Deliverables which are expressly identified as "Owned Deliverables" in a relevant Statement of Work executed by Customer and an executive officer of CMC acknowledging the same, shall be the property of Customer ("Customer Owned Deliverables"); provided that Customer Owned Deliverables shall not include CMC Proprietary Materials. To the extent that Customer Owned Deliverables contain CMC Proprietary Materials, then Customer shall receive and CMC hereby grants a perpetual, non-exclusive, royalty free, worldwide license to use CMC Proprietary Materials solely for its internal business purposes subject to and in accordance with the terms and conditions of this Agreement.

**19. NON-SOLICITATION.** For any services rendered under the Agreement and for a period of one (1) year thereafter, neither Party shall, directly or indirectly, hire or solicit, nor permit its affiliate or contractor to hire or solicit, the services of anyone who is an employee

or contractor of the other Party or its affiliates or was an employee or contractor of the other Party or its affiliates in the six (6) months prior to any solicitation or hiring, without the prior written consent of that Party. In the event of a violation of this provision, the non-breaching Party may seek preliminary and permanent injunctive relief, without posting bond. Upon the non-breaching Party's sole discretion, that Party may choose to require the breaching Party to pay liquidated damages equal to the hired or solicited person's annual compensation. Upon the non-breaching Party's receipt of payment, any injunction shall be dissolved and the Parties shall have no further obligations under this Section 19. The foregoing shall not prohibit solicitation and hiring through general advertising, provided such advertising is not targeted to the other Party's personnel.

**20. EXPORT LAWS.** Customer shall comply with all export and import laws and regulations of the United States and such other governments as are applicable to the Licensed Program. Customer hereby certifies that it will not directly or indirectly, export, re-export, or transship the Licensed Program or related Documentation, information, or media in violation of United States laws and regulations.

**21. U.S. GOVERNMENT LICENSING.** The Licensed Program and any Ancillary Programs provided herewith are commercial computer software. To the extent applicable, the use, duplication, or disclosure by the Government is subject to restrictions as set forth in the Agreement and are licensed with "Restricted Rights" as provided for in FAR 52.227-14, FAR 52.227-19(c), DFAR 252.227-7013, and other agency data rights provisions, as applicable. Customer is responsible for ensuring that copies are marked with a restricted rights notices and legends. CMC reserves all rights not expressly granted to Customer.

**22. PROMOTIONAL MATERIALS.** CMC may use Customer's name and reference the existence of the Agreement and ancillary agreements (without referencing detailed terms and pricing) in marketing materials and presentations.

**23. DATA TRANSFER.** Customer shall not send personally identifiable information to CMC except by secure transfer and in a manner officially authorized by CMC.

**24. SCREENING, PERSONNEL AND STATUS REPORTS.**

24.1 Screening. CMC, as part of its standard hiring practices, conducts a background check on personnel that consists of the following: (i) verifying the individual's educational background beyond high school; (ii) verifying the individual's employment with his/her most recent supervisor or human resources department; (iii) conducting two (2) professional reference checks, if available; (iv) verifying citizenship status in accordance with E-Verify; (v) conducting a criminal background check for felony and misdemeanor convictions for the past seven (7) years; and (vi) undergoing a drug test.

24.2 Replacement of CMC Personnel. Any CMC personnel assigned by CMC to a Customer project may be temporarily replaced by CMC if such individual does not report to work due to illness, accident or other events outside of CMC's control. Customer acknowledges and agrees that there may be a reasonable amount of attrition outside of CMC's control. Upon good cause and written notice to CMC, Customer may request CMC to replace any CMC personnel who is assigned by CMC to a Customer project and CMC will consider the request and take commercially reasonable effort to promptly remedy the matter or replace such person (except in the case where the person has violated a material provision of Customer's promulgated security or workplace policies then CMC shall promptly replace such person). If one of CMC's personnel is removed from a project then CMC will use commercially reasonable efforts to provide substitute personnel of appropriate qualifications subject to availability of such personnel.

24.3 On-Site Performance. CMC shall require personnel, including contractors, third parties, or any other persons providing services at a Customer location to comply with security, conduct and safety regulations and policies substantially consistent with Customer's policies, applicable to Customer's own personnel. Provided, Customer shall provide CMC with written notice of all such applicable policies prior to CMC's personnel traveling to Customer's site.

24.4 Progress Reports and Meetings. Each party shall appoint a representative to act as its designated project manager for the performance of Professional Services. Status review meetings or teleconferences may be held on a periodic basis as reasonably agreed upon by Customer and CMC, in order to review status of Professional Services and to resolve any related issues. Each Statement of Work and Change Order may provide for specific progress reporting.

**25. MISCELLANEOUS.** The Agreement and the Schedules and Exhibits attached hereto constitute the entire and exclusive agreement between the Parties with respect to the subject matter hereof and supersede all prior and contemporaneous communications, whether written or oral. The Agreement may be modified or amended only by the mutual written agreement of the Parties. Any provision hereof found by a tribunal of competent jurisdiction to be illegal or unenforceable shall be automatically conformed to the minimum requirements of law and all other provisions shall remain in full force and effect. Waiver of any provision hereof in one instance shall not preclude enforcement thereof on future occasions. Headings are for reference purposes only and have no substantive effect. The provisions of Sections 2, 4 through 10, 15, 16, 18 through 21, and 25 shall survive termination of the Agreement. Copies of the Agreement and notices generated in accordance herewith shall be treated as original documents admissible into evidence, unless a document's authenticity is genuinely placed into question. The Agreement may be executed in counterparts, each of which shall be deemed an original and together shall be deemed the entire Agreement.

**AGREED AND ACCEPTED** by the undersigned duly authorized representatives of the Parties as of the Effective Date.

**CUSTOMER**

By: \_\_\_\_\_

Print: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**CAMPUS MANAGEMENT CORP.**

By: \_\_\_\_\_

Print: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

SAMPLE

# SCHEDULE A

## SOFTWARE LICENSE

This Schedule A governs the use of any software licensed by Customer. This Schedule A, along with Exhibits A-1 and A-2, and any subsequent mutually executed Exhibit and Addendum, are attached and made part of the Agreement between CMC and Customer. The General Terms and Conditions apply to this Schedule A.

### 1. LICENSE GRANT AND RIGHT OF USE.

1.1 License Grant. CMC grants to Customer a perpetual, non-exclusive, non-transferable license to install and use the Licensed Program, with respect to the License Scope and features relevant to each Licensed Program as set forth on Exhibit A-1, for its own internal business operations and subject to the terms and conditions herein. Customer is hereby granted rights to use the Ancillary Programs distributed with the Licensed Program, subject to all other limitations and conditions herein. To the extent available, CMC passes through all warranties and remedies provided by such third party software vendor. CMC reserves the right to replace Ancillary Programs with substantially similar products, at CMC's expense.

1.2 Delivery and Installation. Upon receipt of the Agreement from Customer and payment as set forth in Exhibit A-2, CMC will electronically transfer the Licensed Program to the computer server(s) residing on the Supported System, which server(s) shall be located at Customer's address set forth in the Agreement or such other address as Customer may designate by written notice to CMC (each the "Designated Server"). The Licensed Program shall be deemed accepted by Customer upon delivery to the Designated Server. Customer acknowledges it is responsible for obtaining, implementing and maintaining the Supported System at its own cost and expense.

1.3 Authorized Copies. Customer may, for its internal use only, make copies of the Licensed Program solely for development (for APIs and SDKs only), back-up, disaster recovery or archival purposes, and an additional copy to use for a test bed solely if Customer has purchased CampusCare Services. Customer may copy the Documentation, as reasonably required to operate the Licensed Program, for Customer's internal use only.

1.4 License Restrictions. Access to and use of the Licensed Program may not exceed the License Scope for which Customer is licensed at any time. Subject to the foregoing, if the License Scope is limited by Campuses, then Customer may move a Campus location, or replace a named Campus with another named Campus owned and controlled by Customer, upon prior written notice to CMC. Customer may allow its contractors to access the Licensed Program solely for purposes of using the Licensed Program on behalf of Customer in accordance with Section 1.1 (and not to provide any professional services, maintenance or support), and provided such contractors have agreed in writing to be bound to confidentiality obligations at least as protective as those set forth in the Agreement.

Customer shall not (and shall not permit any employee, contractor or other party to) use, copy, sublicense, operate as a service bureau, rent, assign, transfer, modify, create derivative works, reverse engineer, decompile, disassemble, translate, or apply any procedure or process to the Licensed Program in order to ascertain, derive, or appropriate the Source Code or any trade secret, design, database structure, stored procedure logic, or process contained in the Licensed Program. However, if applicable, Customer may use the Licensed Program as part of its standard bundled services it provides to its customers, provided that Customer shall not sell or make available the Licensed Program as a standalone service in competition with CMC. Customer shall not alter or remove any proprietary notices, graphics or text contained on or in the Licensed Program. Customer's rights in the Licensed Program will be limited to those expressly granted in the Agreement, and CMC reserves all rights not expressly granted under the Agreement.

### 2. FEES AND INVOICE.

2.1 Invoice; Fees. CMC shall invoice Customer and Customer shall pay the License Fee in accordance with the amounts and requirements set forth in Exhibit A-2 hereto and any mutually agreeable future Exhibits and/or Addenda for additional Licensed Programs or License Scope. All prices are quoted in U.S. dollars and all payments made by Customer under the Agreement.

3. **TERM AND TERMINATION**. The license granted in Exhibit A-1 to the applicable Licensed Program shall continue in force and effect perpetually unless terminated pursuant to Section 4 of the General Terms and Conditions ("Software License Term").

4. **AUDIT AND INSPECTION**. Customer hereby grants a limited license to CMC to remotely access Customer's Supported System and Licensed Programs, as reasonably necessary to assess Customer's compliance with the terms of the Agreement or otherwise to analyze and/or test the Licensed Programs. In addition, CMC shall have the right to enter Customer's premises, as well as to inspect and copy records of Customer, in any and all forms, with respect to its compliance with the Agreement, the use and operation the Licensed Programs, payment of License Fees, and protection of CMC's intellectual property and Confidential Information; such audits shall be conducted with reasonable advance notice, during normal business hours and without unreasonable disruption to Customer's business operations.

# EXHIBIT A-1

## LICENSE SCOPE; LICENSED PROGRAMS AND FEATURES

SAMPLE

# EXHIBIT A-2

## LICENSE FEES AND PAYMENT TERMS

SAMPLE

# SCHEDULE B

## CAMPUSCARE® MAINTENANCE AND SUPPORT

This Schedule B governs CampusCare® maintenance and support services. This Schedule B, along with Exhibits B-1, B-2, and any other subsequently mutually executed Exhibit or Addendum are attached and made part of the Agreement between CMC and Customer. The General Terms and Conditions of the Agreement apply to this Schedule B.

**1. SOFTWARE PRODUCTS COVERED.** CMC will support and maintain, as applicable, the Licensed Program in accordance with the terms and conditions of the Agreement ("CampusCare Services").

**2. SCOPE OF SERVICES.** During the CampusCare Term, CMC shall render the following services in support of the Licensed Program installed on Customer's live production system. The descriptions of applicable support levels and fees are set forth in Exhibits B-1 and B-2, respectively. Service levels, terms and conditions are subject to change upon renewal of the CampusCare Term with at least thirty (30) days prior written notice. During the CampusCare Term, Standard support includes the following services, which may be further defined in Exhibit B-2 attached hereto:

2.1 End User Support Coordinator. CMC and Customer shall mutually designate a person as Customer's "End User Support Coordinator" (EUSC) to coordinate routine End-User support concerning the Licensed Program. End-Users must refer all inquiries regarding the Licensed Program to the EUSC. After consultation with the End-User and determining that the inquiry involves a problem in the Licensed Program, the EUSC may contact CMC and request, and CMC shall provide, the CampusCare Services described in the Agreement. The EUSC shall contact CMC through the designated CampusCare Services e-mail address and telephone numbers when seeking assistance with the use of the Licensed Program or reporting Errors.

2.2 CMC shall maintain a trained staff capable of rendering the CampusCare Services set forth in the Agreement.

2.3 Error Correction. CMC shall be responsible for using reasonable diligence to correct verifiable and reproducible Errors when reported to CMC in accordance with CMC's standard reporting procedures via CMC's centralized issue tracking system. After CMC verifies that the Error is present, CMC, in its discretion, based upon the severity of the Error, will initiate work in a diligent manner toward development of an Error Correction. Following completion of an Error Correction, CMC will provide the Error Correction through a "temporary fix", if possible, consisting of sufficient programming and operating instructions to implement the Error Correction. CMC shall include the Error Correction in subsequent Releases of the Licensed Program. CMC shall not be responsible for correcting Errors in any version of the Licensed Program other than the most recent Release of the Licensed Program. However, CMC shall continue to support the immediately preceding Release for a reasonable period sufficient to allow Customer to implement the newest Release, not to exceed 90 days after making the new Release available. For the most current severity level descriptions, please see

<http://www.campusmanagement.com/EN->

[US/aboutUs/Pages/Incident-Severity.aspx](#), which may be updated from time to time.

2.4 Releases. CMC shall, from time-to-time, deliver new Releases to its customers generally containing Error Corrections and Enhancements. Customer acknowledges and agrees that the Agreement covers Releases solely to the extent such products are made generally available to all customers of CMC as part of the same level of CampusCare Services. Any revisions to the Licensed Program constituting new commercially available products, which may include new major functionality or material changes in technical specifications not made generally available to other customers receiving the same level of support services, may be purchased under separate mutually agreeable arrangements. CMC shall provide reasonable assistance to help Customer install each new Release, but installation and implementation of the CampusNexus™ CRM Release(s) is not included as part of the CampusCare fee, notwithstanding anything to the contrary in the Agreement.

2.5 Keys. Limited keys, if applicable, for training are included in accordance with the descriptions and rates set forth in Exhibits B-1 and B-2. These keys are intended for use with courses offered by The Learning Center. Unused keys will expire at the calendar year end and cannot be carried forward.

2.6 Third Party Products. CMC will use reasonable efforts (up to a maximum of thirty (30) minutes) attempting to diagnose and resolve Licensed Program problems associated with Third Party Products for no additional fee and Customer shall pay on a time and material basis for work performed over thirty (30) minutes. If at any time CMC reasonably determines the problem is primarily caused by the Third Party Product(s), and not the Licensed Program, then CMC shall be deemed to have satisfied its obligation to address the problem. Customer acknowledges that CMC may not be able to assist Customer with problems associated with Third Party Products, and Customer is encouraged to contact vendors of Third Party Products for pertinent support and maintenance services.

2.7 Exclusions. Unless otherwise agreed to via a separate addendum, CampusCare Services covers production environments and excludes services and support to update and maintain non-production environments (such as testing and development environments) and further excludes support of integrations. CampusCare Services shall not include resolving issues related to reconfiguration of the Licensed Program as a direct result of sizing/space related issues, restoring/re-installing/re-implementing production server components, restoring corrupt databases, performance of business functions such as creation/configuration of rules/teams/reports, or modification and/or manipulation of the Licensed Program including, but not limited to, stored procedures, predefined routines, installation of scripts, standard/custom reports,

and data written to the Licensed Program from Third Parties Products, as applicable.

Any of the following will cause the deployment of the software to not be in a Supported Environment: (i) improper installation of a Licensed Program, other than by CMC; (ii) combination of the Licensed Program (in whole or in part) with hardware or software not approved by CMC; (iii) use of a Licensed Program in a manner inconsistent with its Documentation; or (iv) accident; physical, electrical or electromagnetic stress; neglect; misuse; failure or fluctuation of electric power, air conditioning or humidity control; failure of media not furnished by CMC; excessive heating; fire and smoke damage; operation of the Licensed Program with hardware, software or telecommunication interfaces not meeting or not maintained in accordance with the manufacturer's specifications. CMC will have no obligation or liability for Errors, issues and non-conformities if the Licensed Programs are deployed in a non-Supported Environment. With respect to CampusNexus CRM, CMC highly recommends Customer engage CMC's professional services organization for assistance when installing upgrades for CampusNexus CRM. Any issues or problems arising out of Customer configuring and installing an upgrade are not covered under CampusCare Services. If the software has been customized, the upgrade may cause system failures. Any problems with customizations that Customer reports to CMC that are related to or caused by the upgrade are not covered under CampusCare Services.

Should CMC provide technical support in connection with problems that are beyond the scope of the CampusCare Services, that are not Errors in the Licensed Programs, or for any incremental services, then Customer shall pay for any such services on a time-and-materials basis.

**2.8 Additional Services.** Customer may request services not covered under CampusCare Services pertaining to the Licensed Program (including, without limitation, data conversion, report-formatting assistance, diagnosis and repair of infrastructure problems, or resolving issues that are excluded from CampusCare Services under Section 2.7 above), provided that such assistance, if agreed to be provided, shall be subject to CMC's standard labor rates for such services and may require a mutually executed Addendum or a Statement of Work for Professional Services. Customer shall pay the invoiced amount promptly upon receipt of such invoice, but in no event later than thirty (30) days after the invoice date.

### **3. CUSTOMER RESPONSIBILITIES.**

**3.1 Supervision and Management; Upgrade Responsibilities.** Customer is responsible for undertaking the proper supervision, control and management of its use of each Licensed Program, including, without limitation: (i) operating the Licensed Program in conformity with the Documentation and all instructions provided by CMC; and (ii) following reasonable procedures for the security of data, accuracy of input and output, and back-up plans, including restart and restoration in the event of hardware or software error or malfunction. With respect to CampusNexus CRM, Customer is responsible for undertaking the proper supervision, control and management of its use of each Licensed Program, including, without limitation, assuring proper installation and configuration of the Supported Environment, and installing and configuring each Release

and the system based on the instructions and Documentation provided by CMC and testing the system after each upgrade.

**3.2 Training.** Customer is responsible for proper training of all appropriate personnel in the operation and use of the Licensed Program. Any training provided by CMC will be provided under a separate training plan.

**3.3 Access to Personnel and Equipment.** Customer will provide CMC with access to Customer's personnel and equipment as needed to provide CampusCare Services. This access must include the ability for remote access to the equipment on which any Licensed Programs are operating and to obtain the same access to the equipment as that of Customer's employees having the necessary privilege or clearance level. CMC will inform Customer of the specifications of the equipment and associated software required for CMC's access, and Customer will be responsible for the costs and use of that equipment and software. Customer will be responsible for having one or more employees observing, approving and applying any changes recommended by CMC. Customers who have not contracted with CMC for hosted services will be responsible for implementing desired Customer organizational controls including but not limited to role based access controls, password policies, monitoring, logging and auditing.

**3.4 Problem Determination and Resolution.** Customer will be responsible for assisting CMC technical support engineers in determining the cause and scope of Errors, including, without limitation, by performing network traces, capturing error messages, and collecting configuration information. With respect to the CampusNexus CRM Licensed Program, Customer also will be responsible for performing activities to implement resolutions, commensurate with the level of severity of the Error, as suggested by CMC. Resolution activities may include changing or installing new versions of web client software or new components, or modifying processes.

**3.5 Equipment.** Customer shall be responsible for procuring, installing, and maintaining the Supported System. Customer shall be responsible, at its sole cost and expense, for procuring updates to Third Party Products.

## **4. FEES AND INVOICE.**

**4.1 Fees.** Customer shall pay fees in the amount set forth on Exhibit B-2 hereto for the level of service selected by Customer. If the CampusCare Term (as defined in Section 5 below) commences after January 1, then, for the initial calendar year, Customer shall pay fees and charges on a pro-rated basis for the remainder of such year. The pricing set forth for CampusCare Services is conditioned on the CampusCare Term renewing continuously on an annual basis without Customer lapse of service (other than caused by CMC's uncured material breach) or Customer's election to decrease its service level. In the event of such lapse, Customer shall pay current through the date of recommencing services and thereafter based on CMC's then-current standard fees and charges. Annual renewals are subject to limited increases in accordance with Section 2.3 of the General Terms and Conditions.

**4.2 Invoice.** Customer shall be invoiced for the initial CampusCare Term in accordance with the payment schedule set forth

in Exhibit B-2. Thereafter, invoices will be sent prior to the end of each calendar year of the CampusCare Term, with the first payment due to CMC before December 31 in advance of the next one-year CampusCare Term. Customer shall remain current in all payments as a condition to CMC continuing to provide CampusCare Services.

**5. TERM AND TERMINATION.** CampusCare Services shall commence on the date set forth in Exhibit B-2 and shall continue through December 31 of such calendar year ("CampusCare Term"). Thereafter, the CampusCare Term shall automatically renew for successive periods of one year, unless either Party provides at least thirty (30) days prior written notice of cancellation prior to the expiration of the then-current CampusCare Term or until terminated pursuant to Section 4 of the General Terms and Conditions. The CampusCare Term shall renew at the same service level then in effect at the end of the most recent concluding period. In no event, however, shall the CampusCare Term extend beyond the prescribed Software License Term.

**6. LICENSE SCOPE.** If at any time Customer expands its License Scope (which may include increases in Record Count, Users,

Campuses, or other terms as applicable) in accordance with the terms of the license, Customer shall pay the additional proportionate CampusCare Services fees, which fees shall initially commence contemporaneously with the increased License Scope and be prorated for the remainder of the then-current year of the CampusCare Term.

**7. SOURCE CODE ESCROW.** Within 120 days following the Effective Date of the Agreement, Customer may elect to become a beneficiary under CMC's Master Escrow Service Agreement with Iron Mountain Intellectual Property Management for the CampusNexus Student and/or CampusNexus CRM software, as applicable ("Escrow Agreement"). The deposit is made available to Customer as a beneficiary in accordance with the terms of the Escrow Agreement and provided Customer is under a current CampusCare Term and is current in its payment obligations for CampusCare Services. The license rights and restriction under the Agreement shall govern the use of the deposit in the event of a release. Customer is responsible for paying the beneficiary account set-up and annual escrow fees to Iron Mountain.

SAMPLE

# EXHIBIT B-1

## DESCRIPTION OF SUPPORT LEVELS

SAMPLE

## EXHIBIT B-2

### RATE SCHEDULE AND KEYS FOR CAMPUSCARE® STANDARD AND PREMIUM SERVICES

SAMPLE

# SCHEDULE C

## CAMPUSNET® HOSTING SERVICE

This Schedule C governs CampusNet® hosting services ("CampusNet Services"). This Schedule C, along with Exhibits C-1, C-2, C-3, and any subsequently mutually executed Exhibit and Addendum are attached and made part of the Agreement between CMC and Customer. The General Terms and Conditions of the Agreement apply to this Schedule C.

### 1. DEFINITIONS

1.1 "CMC Software" shall mean the Licensed Programs and/or APIs identified in Exhibit C-1 attached hereto, so long as the Licensed Programs and/or APIs remain subject to CampusCare Services, and any other software owned or licensed by CMC that is distributed to CampusNet Services subscribers, including, but not limited to, operating systems, application software and utilities used to provide the CampusNet Services.

1.2 "Customer Software" shall mean the software other than the CMC Software, that is owned or licensed by Customer and is authorized by CMC to be deployed on the CampusNet Services, subject to additional fees and charges and in accordance with the CampusNet Services.

### 2. CMC'S RESPONSIBILITIES

2.1 Scope of Service. The CampusNet Services shall include: (i) the deployment and administration of server hardware and the licensed CMC Software at the CMC hosting center; (ii) installation of all updates, upgrades, Releases, Error Corrections, and Enhancements (except that configuration of new features exposed by such installation will require configuration by Customer or a separate Statement of Work); (iii) monitoring communication circuit that is reasonably within the control of CMC or CMC's Internet service provider and hardware availability; (iv) where applicable and identified in an Exhibit hereto, basic Microsoft SMTP service limited to e-mail (subject to additional setup charges); (v) routine backups of software and data residing on the servers. All of the foregoing are subject to and in accordance with the CampusNet Services. The hosting of Customer Software requires the prior written consent of CMC and must be set forth in a mutually executed Addendum attached hereto. Additional setup charges and fees may be incurred for hosting of Customer applications. The CampusNet Services shall be pursuant to the Service Level Agreement set forth in Exhibit C-4. CMC will not support environments that are not supported/certified by CMC product development or by third party vendors.

2.2 Standards of Performance. CMC agrees to use due care and act in good faith in its performance of the CampusNet Services and to provide the CampusNet Services in a professional and businesslike manner and in accordance with standard industry practices.

2.3 Data Backup. CMC shall perform a complete backup of Customer Data each night using generally accepted backup procedures ("Backup Data"). The Backup Data shall be maintained at the CampusNet Services colocation center and shall be retained for up to seven (7) days before being destroyed; provided, weekly, CMC shall make a copy of the Backup Data and store it at an off-site storage

location ("Off-site Center"). The Backup Data shall be retained at the Off-site Center for twelve (12) months before being destroyed. Upon Customer request and for no additional charge, so long as Customer is not in default of the Agreement, CMC shall provide a copy of the Backup Data on a monthly basis. For an additional charge, Customer may request a copy of the Backup Data on a more frequent basis. The CampusNet Services is operated in a manner designated to provide for high levels of system availability. This includes redundancy for all major system components, or where appropriate, equipment supported by manufacturers providing the CampusNet Services with 24/7/365 service.

2.4 Availability of Service. The CampusNet Services and all Customer Software shall be accessible to Customer's authorized users 24 hours per day, 7 days a week, excluding scheduled times for maintenance and updates of which Customer will be notified in advance and any Downtime due to Internet outages resulting from failures reasonably outside the control of CMC or CMC's hosting provider, corruption of Internet route information within a tier 1 internet route server environment, major connectivity failures within or between major tier 1 providers or corruption of internet root level DNS services. In the event that, during any three (3) month period, the Customer Software experiences three or more episodes of Downtime with one or more episodes of Downtime lasting at least six (6) hours each and two (2) or more additional episodes of Downtime lasting at least three (3) hours each, Customer shall have the right to terminate this Agreement immediately upon forty eight (48) hours notice to CMC, without payment of any penalty, which termination right shall be Customer's sole and exclusive remedy for Downtime other than Downtime caused by CMC's willful misconduct. For clarification, "Downtime" shall exclude service disruptions arising from Customer's systems or service providers. CMC will pass through, on a proportionate basis, to Customer any credits received from its third party hosting provider as a result of the Downtime.

2.5 Control of Services. CMC shall manage the CampusNet Services. CMC may, in its sole discretion (i) reengineer CMC Network components and/or change locations where services are performed; (ii) perform its obligations through its subsidiaries or affiliates, or through the use of selected independent subcontractors; and (ii) modify and/or replace technology or service architectures relating to the services. Notwithstanding clause (ii) above, CMC shall be responsible for such other party's performance of CMC obligations under the CampusNet Services.

2.6 Personnel. CMC will dedicate personnel necessary to perform its responsibilities hereunder. CMC reserves the right to determine the personnel assigned to perform the CampusNet Services and to replace, rotate or reassign such personnel during the CampusNet Term (as defined in Section 7.1 below).

2.7 Services Outside Scope. Any custom services provided outside the scope set forth above shall be engaged under Professional Services, subject to CMC's requirements, including, without limitation, any billing, and technical requirements. Any changes in federal, state or local requirements, or any Customer specific requirements, including, without limitation, with respect to security or privacy, that result in CMC providing additional services or incurring costs, shall be billed to and promptly paid by Customer. CMC reserves the right to refuse to provide certain services in the event Customer's requirements are not practicable or changes in law affect CMC's performance of obligations hereunder.

2.8 Minimization of Planned Service Disruptions. Whenever conditions reasonably permit, the parties will mutually agree on the scope, timing, frequency and duration of any planned service disruptions or delays and will jointly attempt to minimize any unnecessary impact on Customer's business operations. Routine daily maintenance will be accomplished whenever possible by scheduling between the hours of 10:00 p.m. and 8:00 a.m. Eastern Time. In addition, longer maintenance will be accomplished when possible on weekends between the hours of 6:00 p.m. ET Saturday and 8:00 a.m. ET Monday, unless CMC notifies Customer otherwise. CMC shall monitor the CampusNet Services 24/7/365 to assure that the CMC Software and any Customer Software remain available for use.

2.9 Unplanned Service Disruptions. Unplanned service disruptions ("Downtime") may occur from time-to-time. CMC will use commercially reasonable efforts to attempt to prevent Downtime that could impact Customer's business operations to the extent such factors are within CMC's reasonable control; provided, Customer acknowledges that conditions of Customer and third parties may affect Customer's use of the CampusNet Services, for which CMC shall have no liability or obligations (by way of example and not limitation, Internet disruptions or third party software bugs), although CMC will attempt to coordinate with Customer as reasonably requested to assist to correct the Downtime to the extent practicable.

2.10 Disaster Recovery Plan. Throughout the Term, CMC shall maintain a disaster recovery plan and the capacity to execute such plan. Upon request by Customer, which shall not be more frequently than annually, CMC shall provide Customer with an executive summary of CMC's most current disaster recovery plan.

### **3. CUSTOMER RESPONSIBILITIES**

3.1 Customer Relationship Manager. Customer will appoint a relationship manager to manage the relationship established by this Agreement (the "Customer Relationship Manager") who will:

3.1.1 Coordinate and monitor Customer's obligations under the CampusNet Services, and serve as the primary liaison with the CMC relationship manager.

3.1.2 Provide communication on such events as the addition or deletion of user accounts and reporting problems with the CampusNet Services.

3.1.3 Provide CMC with an outage communications plan consisting of the name, telephone numbers including cell number, and email address of Customer personnel to be notified in the event of an outage. CMC shall contact Customer promptly regarding an outage or Downtime.

3.2 Connectivity. Customer agrees to provide the high-speed Internet and telecommunications connections and supporting equipment required by CMC to maintain connectivity between Customer's remote location(s) and the CampusNet Services location. Customer will bear the costs of such connections and supporting equipment. CMC may assist Customer in procuring and defining such connectivity in which case Customer may, at CMC's discretion, be billed for such professional services.

3.3 Users; Policies. Only Users are authorized to access and use the CampusNet Services, subject to and in accordance with this Schedule C. Customer agrees to adhere, and cause its authorized users to adhere, to the Policies.

3.4 Software Licenses. CMC software and the CampusNet Services use many components of Microsoft products. At all times during the CampusNet Term, Customer is required to hold a basic Microsoft® Office license for each Customer computer that will be used on the CampusNet Services. To the extent applicable, Customer's statement attesting to the existence of such valid license is attached as Exhibit C-2.

3.5 Required Printer Drivers. CMC uses the Citrix universal print driver. Other printers may work, but Customer acknowledges that formatting and functionality may fail on any non-compliant printing standards or drivers. Customer may require assistance from its authorized printer vendor.

### **4. SECURITY; COMPLIANCE**

4.1 Security. Customer shall comply, and cause all parties with access to its systems to comply, with CMC's reasonable security policies, as set forth in the Policies. Customer agrees to keep, and cause its authorized users to keep all passwords and system access information confidential in order to protect the integrity of the CampusNet Services and Customer Data.

4.2 Compliance. Customer shall implement and maintain adequate measures to comply with security and privacy requirements as provided by applicable law, and Customer shall notify CMC in writing of any Customer specific requirements requested of CMC.

### **5. FEES**

5.1 General. The pricing for the CampusNet Services provided herein is set forth in Exhibit C-1, and generally consists of: (i) one-time initialization costs for assisting the Customer to establish connectivity with the CampusNet Services at each Campus or Customer location; (ii) a monthly charge for the CampusNet Services for CMC Software based on the number of Users and Record Count, as applicable; and, if applicable (iii) a set-up fee for the Microsoft® Client Access License, as further described in Section 5.3.

5.2 Calculation of Pricing for Customer. The pricing for Users is calculated in Exhibit C-1. Customer and CMC may agree to increase the agreed upon number of Users, subject to payment based on the monthly rate set forth in Exhibit C-1 attached hereto. To the extent applicable, CMC will send Customer a list of all named Users as of the Effective Date, and thereafter upon request.

5.3 Client Access License. In addition, to the extent applicable, Customer agrees to pay a charge per named User for a Microsoft® Client Access License ("CAL") and other appropriate charges for Customer specific third-party licenses as set forth in Exhibit C-1 ("Third Party License Fees"). These charges shall be due and payable at the time any named User is added to the CampusNet Services, and charges are subject to change in the event the third party licensor changes its pricing or requirements.

**6. BILLING AND PAYMENT PROCEDURES**

6.1 Payment Schedule. CMC will bill Customer based on the number of Users and Record Count, as applicable, as further described in Exhibit C-1.

6.2 Billing and Payment Dates. CMC will bill the one-time initialization costs as set forth in Exhibit C-1. CMC will bill Customer monthly by the 10<sup>th</sup> of the following month for Users and Record Count as set forth in Exhibit C-1 and any additional Users added or increase in Record Count thereafter. Customer shall pay CMC in full on or before the fifteenth (15<sup>th</sup>) day following the date of the invoice. If Customer falls into arrears on payments, CMC may require Customer to maintain a deposit as a condition to CMC continuing to provide CampusNet Services.

**7. TERM AND TERMINATION**

7.1 Term. The CampusNet Services shall commence on the Commencement Date and will continue for the period specified in Exhibit C-1 (the "CampusNet Term"), unless either Party cancels the CampusNet Services upon not less than ninety (90) days written notice prior to any anniversary of the Commencement Date ("Early Termination") or until terminated pursuant to Section 4 of the General Terms and Conditions. Should either Party notify the other in writing of an Early Termination, the Parties will meet to determine the most advantageous termination procedure. Provided, Customer acknowledges and agrees that its Early Termination of the CampusNet Services shall require it to promptly pay a termination fee pursuant to Exhibit C-1; the parties acknowledge that the foregoing payment constitutes liquidated damages and is a reasonable fee and a genuine pre-estimate of CMC's losses. In no event, however, shall the

CampusNet Term extend beyond the prescribed Software License Term or CampusCare Term.

7.2 Procedures Upon Termination. Upon termination of the CampusNet Services for any reason, CMC shall disable Customers' access to the CampusNet Services and Customer shall promptly pay all amounts due and payable hereunder to CMC in accordance with Section 6.2. Upon request and provided CMC has received all amounts due and payable hereunder, CMC shall promptly return all Customer Proprietary Materials, and copies of all Customer Software and Customer Data, in CMC's possession, if any. CMC shall retain the deposit, if any, if the Agreement terminates as a result of Customer's breach. CMC does not provide connectivity to the CampusNet Services site; therefore, in event of termination, Customer continues to be responsible for payment and termination of Customer's telecommunications arrangements. Customer shall pay CMC its reasonable fees and expenses on a time and materials basis if CMC assists Customer with the transition of the CMC Software, Customer Software, and/or Customer Data to Customer's system.

**8. SERVICE LEVEL AGREEMENT.** CMC provides a Service Level Agreement as set forth in Exhibit C-4 ("CampusNet SLA").

**AGREED AND ACCEPTED** by the undersigned duly authorized representatives of the Parties as of the date written below.

**CUSTOMER**

By: \_\_\_\_\_  
Print: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

**CAMPUS MANAGEMENT CORP.**

By: \_\_\_\_\_  
Print: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

# EXHIBIT C-1

## CAMPUSNET® SERVICE TERM, PRICING AND USERS

SAMPLE

## EXHIBIT C-2

### CAMPUSNET® SERVICE MICROSOFT® LICENSE COMPLIANCE

SAMPLE

# EXHIBIT C-3

## NON-PRODUCTION ENVIRONMENTS

SAMPLE

# EXHIBIT C-4

## CAMPUSNET® SERVICE LEVEL AGREEMENT

SAMPLE

# EXHIBIT C-5

## CAMPUSNET® DATA SHARING POLICY

SAMPLE

**Item 7: Data Sharing Policy**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.

## EXHIBIT C-5

### CAMPUSNET<sup>SM</sup> DATA SHARING POLICY

This Data Sharing Policy is provided by CMC for the benefit of Customer to establish system and data security guidelines for the performance of services under and during the applicable term of the Agreement, regarding CMC's use, transfer, storage and protection of the Customer's data.

#### 1. Intended Use of Data

Data will be used solely in connection with performance services under the mutually executed agreements entered into between CMC and Customer.

#### 2. Constraints on Use

Data supplied by Customer to CMC, or if applicable collected by CMC on behalf of Customer, relating to Customer's students, prospective students, employees or alumni is the property of Customer and shall not be shared with third parties without the written permission of Customer or as provided for in the Agreement. Customer data shall not be sold or used, internally or externally, for any purpose not directly related to the scope of work defined in this Policy without the written permission of Customer.

#### 3. Data Security

CMC shall employ appropriate technical and procedural measures that a similarly situated and reasonably prudent services provider in the same industry would provide under like circumstances designed to comply in all material respects with applicable laws regarding confidentiality and safeguarding of data, to protect Customer's data from unauthorized physical and electronic access. Methods employed are tested by CMC's authorized external, independent auditors on an annual basis and the final audit report may be shared with Customer upon request.

#### 4. Data Categories

The following definitions shall be used to classify data for security purposes:

**Normal:** The least restrictive class of data. Although it must be protected from unauthorized disclosure and/or modification, it is often public information or generally releasable under Customer procedures for processing public records requests. Examples of this class of data are: class schedules, course catalogs, general ledger data, and employee demographic statistics.

**Sensitive and/or Confidential Information:** These classes may be differentiated under applicable laws, but generally include data for which specific protections are required by law or for which agencies are obligated to prevent identity theft or similar crimes or abuses. Examples of this class are: peoples' names in combination with any of the following: driver's license numbers, social security numbers, birth date, student or employee ID number, address, e-mail addresses, telephone numbers. Also included are: education records including papers, grades, and test results, or information identifiable to an individual that relates to any of these types of information. In addition, these classes include data elements that are either passwords in the traditional sense of function in the role or an access control such as a credit card number, expiration date, PIN, and card security code. Examples include: credit card numbers, expiration dates, PINs, card security codes, financial profiles, bank routing numbers, medical data, and law enforcement records. The foregoing data, or parts thereof, is sometimes referred to as "personally identifiable information" under applicable laws.

#### 5. Data Handling Requirements

Data handling requirements may vary depending on the classification of data shared with CMC. Some data shared with CMC will involve a mix of data classes. Whenever data elements are aggregated for collection, transmission, or storage, the aggregate data shall be handled using the protocols that apply to the most sensitive data element.

CMC shall have a written policy requiring all data classified as Sensitive and/or Confidential Information to be encrypted in transit and either stored in a protected datacenter or, when stored on mobile devices, to use encryption in storage. CMC shall tightly control and audit access to these elements.

#### 6. Network Security

Connections to CMC computers utilizing the Internet, whether from client access or remote administration, must be protected using any of the following industry standard cryptographic technologies: SFTP, SSL/TLS, IPsec, SSH/SCP, PGP, or via Citrix®.

#### 7. Campus Management Personnel

CMC shall limit access to Sensitive and Confidential data to those personnel with a well-defined business need to know and who are bound to non-disclosure obligations at least as protective as set forth in the Agreement.

#### 8. Security Training

CMC shall provide periodic training for its personnel regarding CMC internal security policies and procedures, and on applicable state and federal legal requirements for protecting Sensitive and Confidential data.

#### 9. Criminal Background Checks

Staff members of CMC with access to Confidential Information have been subject to a criminal background check and have no record of any felony convictions involving fraud or dishonesty within the past seven (7) years.

#### 10. Prohibition on Mobile Devices and Removable Data

CMC shall have a written policy prohibiting the transfer or storage of unencrypted customer information on employee mobile devices or removable storage media for any reason. This policy shall be made available to each employee individually and shall be strictly enforced.

#### 11. Compliance with Applicable Laws and Regulations

CMC and Customer shall comply with all applicable laws and regulations protecting Sensitive and Confidential Information, including the Family Educational Rights and Privacy Act (FERPA) and Gramm Leach Bliley Act (GLBA).

#### 12. Notification of Security Breaches

Certain laws may require that affected individuals be notified in the event of a breach of privacy. Pursuant to the remedies required by applicable law, CMC agrees that, in the event of any breach in data security where unencrypted personal information of Customer's student, prospective student, employee or alumnus was acquired by an unauthorized person, CMC shall notify Customer of the security breach within 24 hours of discovery, or as otherwise required by the applicable law, and assist Customer with the notification action required under such law. To the extent the breach was caused by CMC, it shall pay for the costs of notifying the affected individuals pursuant to applicable law pursuant to the Agreement; to the extent the breach was caused by Customer, Customer shall pay CMC for time and expenses incurred to assist vendor with the analyses and notification of affected individuals.

#### 13. Amendments and Alterations to this Policy

CMC may update this Policy from time-to-time by providing prior written notice to Customer and a fifteen (15) day opportunity for Customer to comment. Provided, no amendment shall be effective if it reduces the obligations of CMC from the terms set forth in this Policy, except by the express mutual written agreement of Customer and CMC.

#### 14. Customer Obligations

Notwithstanding anything to the contrary, Customer and its representatives shall implement and maintain technical and procedural policies which comply with this Policy in the same manner as required of CMC herein. Customer acknowledges and agrees it is solely liable with respect to Customer's and its representatives' collection, access, use, transfer and storage of data, other than data in the control of CMC as specifically set forth herein (by way of example, and not limitation, Customer shall not send data via unencrypted email to CMC or by using FTP when SFTP is made available to Customer). CMC, its affiliates and representatives shall not be held liable to the extent a breach of data arises from a breach of this paragraph.

#### 15. Termination of Services

In the event Customer or CMC terminates this Policy, or CMC ceases operation, CMC shall return to Customer, or destroy, all data collected in the course of the Agreement. CMC shall certify in writing that all copies of Sensitive and Confidential data stored on CMC servers, backup servers, backup media, or other media including paper copies have been permanently erased or destroyed. For purposes herein, "permanently erased" means the data have been completely overwritten and are unrecoverable.

**Item 8: Project Team Résumés**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.

**Résumés of Campus Management Corp.**

**Project Team Members**

**for the Francis Marion University CampusNexus Implementation**

## **CRM Module**

The Campus Management Corp. professional services team members mentioned in this section can implement the CRM module. Résumés begin on the next page.

# Andrea Ernewein

## Project Manager

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### Summary

Andrea Ernewein has been working with Campus Management as a project manager implementing solutions in the Higher Education industry since the 2008 acquisition of Talisma Corporation's CRM division. She began her career as a Systems Engineer programming and implementing solutions in the Communications, Insurance, and Financial industries. She then worked her way up as a Team Lead supervising 6-10 programmers, and managing the development and deployment of CRM applications. Andrea was then promoted to Project Manager in 2001 at eAssist Inc., which was later acquired by Talisma Corporation in 2004.

In addition to managing the implementations, Andrea was also responsible for gathering and documenting functional and technical requirements, as well as training and configuring the solutions. This product knowledge has assisted Andrea in understanding and successfully managing HE projects from all facets for the last 16 years. She has managed projects in all areas of higher education, not-for-profit, for-profit, faith-based, as well as multi-campus career colleges and universities in the US and Canada.

---

### Areas of Expertise

- ✓ Recruitment, Admissions, Retention, Career Services in both US and Canadian Higher Education
  - ✓ HE System Design and Improvement
  - ✓ Project Management
  - ✓ Risk Management and Mitigation
  - ✓ Database structure and Analysis
  - ✓ IT and systems operations
  - ✓ Campaign Marketing and Communications
  - ✓ Workflow and Process Reengineering
  - ✓ Influential Presentation skills, Customer interaction skills and team work
- 

### Technical Skills and Experience

- ✓ CMC CampusNexus products
  - ✓ PC and Macintosh computers
  - ✓ Windows/Mac Operating Systems
  - ✓ Microsoft Office (Word, Excel, Power point, Project, VISIO)
  - ✓ Internet Explorer/Safari/Firefox/Web form applications
  - ✓ IMA EDGE, JetForm, VSI-Fax
- 

### Project Experience

- ✓ 16 Years Implementation Experience with HE and CRM solutions.
  - ✓ 14 Years Project Management Experience.
-

- ✓ 7 Years development and Implementation Experience with web-based solutions.

---

## Education and Certifications

- ✓ Certificate of Environmental Engineering: Conestoga College (Kitchener, Ontario, Canada)
- ✓ Bachelor of Arts in Geography: Brock University (St. Catharines, Ontario, Canada)
- ✓ Successful Project Management Skills - SkillPath Seminars
- ✓ Introduction to UNIX Course - CDI Corporate Education Services
- ✓ EDGE Programming Course - IMA Corp

# Arunkumar Chamarajanagar Nagendraiah

## Professional Services Implementation Consultant

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### Summary

Arun has around 11 years of experience in the IT Industry in the areas of CRM, ERP and contact center. He has worked as a CRM Sr. Service Delivery Manager, Technical Architect, Senior Technical Analyst, and Senior Technical Specialist for a number of CRM and CTI implementation projects across multiple industries around the globe. These have included higher education, BPO, telecom, banking, insurance, and asset management systems. Arun has a rich amount of experience working on Talisma CRM, as well as other CRM and telephony solutions.

---

### Areas of Expertise

Arun has been involved in business process mapping, solution design, implementation and configuration of CRM suites, multi-channel integration with email, fax, postal mail, and web portal and database archiving for over 100 CRM projects. Additionally, he has worked on developing CRM architectures, Talisma CRM upgrades, and batch integrations with a variety of student information systems. He has conducted technology audit exercises, helped to establish performance fine-tuning best practices, assisted with solution design and technical training, facilitated custom reports, and engaged in development work.

---

### Technical Skills and Experience

Proficient with MS SQL Server 200x, SSIS Packages, Windows 200x

Systems Worked on: Talisma CRM, Siebel CRM, Salesforce.com, Genesys (CTI and Contact Center), and Oracle's Telephony@work

---

### Project Experience

Role: CRM Technical Architect (CRM Projects: Handled over 100 CRM projects including 50+ higher education CRM projects)

- Understanding Business requirements and Business process mapping
- Solution design and development [architecting the Talisma CRM solutions for higher education vertical]
- Pre-sales activities (Proposals, Estimations, Architectural designs etc...)
- Talisma Product Upgrades, Installations and Technical & functional training and Product Demo
- Handling customer escalations

Role: Sr. Service Delivery Manager

- Prepare and maintain detailed up-to-date project plans, set deadlines, assign responsibilities, run Customer Steering Committee meetings, and monitor and summarize progress of project to ensure on time delivery of deliverables and milestones
- Act as the primary customer interface for all project-related interactions
- Direct interaction/ Supervision of software Implementation Consultants.
- Responsible for coordinating with other departments (such as sales, marketing, development, and account management) to ensure successful software implementation.
- Prepare reports for upper management regarding status of project as well as customer friendly reports and expectations documents
- Accountable for managing service delivery and managing Technical teams, Infrastructure teams and Global Delivery team

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## Education and Certifications

Arun has a Bachelor's Degree in Computer Science & Engineering and secured 6th rank at Kuvempu University.

# Magesh Babu Shanmugam

## Solution Architect

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### Summary

Magesh has been working with Campus Management Corp. since 2001. During his tenure at Campus Management Corp., he has performed varied roles including Solutions Architect, Business Analyst and Implementation Consultant, Technical Consultant, Tech Lead in Talisma support Team, Manager in Elite Engineering Team, Quality Assurance Engineer. Magesh holds a Master's degree in Computer Applications.

Magesh has over 12 years of rich experience in IT industry. He has led implementations in Talisma CRM across various geographies. Magesh's experience in handling pre-sales, business development and practice management activities has proven to be instrumental in the success of several IT deployments.

---

### Areas of Expertise

- Solid understanding of the higher education industry.
  - Business process mapping/re-engineering.
  - Functional/Technical audits.
  - Trainings for power users and end users.
  - Research, communication, documentation and problem solving skills
- 

### Technical Skills and Experience

- Talisma CRM
  - MS SQL querying
- 

### Project Experience

Magesh has extensive knowledge in Talisma CRM. He has worked on deploying Talisma CRM across multiple domains. Within the higher education domain, he has worked with clients from the North America. His vast exposure brings excellent process knowledge and globally accepted best practices.

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### Education and Certifications

Magesh Holds a Master's Degree in Computer Applications.

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# Venkatesh C Anantharam

## Sr. Technical Consultant

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### Summary

Venkatesh has over 10 years of rich experience in IT industry in different domains like Law Enforcement solutions, E-Governance solutions and CRM and deployed the products across various geographies.

Venkatesh has been working with Campus Management Corp. since 2006. During his tenure at Campus Management Corp., he worked on Talisma CRM and performed varied roles including Technical Support Analyst, CRM Expert, Technical lead, Technical Consultant, Global Delivery Manager. Venkatesh has got rich experience in deploying Talisma CRM in various industry verticals like higher education, Banking, BPO, Insurance, retail industries.

---

### Areas of Expertise

- Business Process Mapping.
  - Functional and Technical audits.
  - Talisma CRM product Trainings for power users and end users.
  - Expertise in Talisma CRM Upgrade and various SIS system batch integration.
  - Best Practices and Custom SQL reports.
- 

### Technical Skills and Experience

- Talisma CRM
  - MS SQL Server 2008 administration and SQL scripting, SSIS Packages, Windows Server OS, VB 6.0,
- 

### Project Experience

Venkatesh has extensive technical knowledge in Talisma CRM. He has worked on deploying Talisma CRM across multiple domains. Within the higher education domain, he has worked with clients from the North America, Australia and the Asia Pacific. His vast exposure brings excellent technical and functional knowledge and globally accepted best practices.

---

### Education and Certifications

Venkatesh holds a Master's degree in Computer Applications.

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## **Student Information System Module**

The Campus Management Corp. professional services team members mentioned in this section can implement the student information system module. Résumés begin on the next page.

# George Valiente

## Director of Consulting Services

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### Summary

George joined Campus Management Corporation in 2004. Since joining CMC, he has led the implementation of CampusVue and CampusNexus Student and other products at various colleges and universities, as an implementation consultant, a Project Manager and Service Delivery Manager. Prior to joining Campus Management, he worked as a Special Education teacher in the public school systems and owned a computer repair shop and internet café.

In his current role as Director of Consulting Services, he is responsible for the management of the functional teams which implement the CampusNexus suite of products and Project Sponsorship for strategic accounts.

---

### Areas of Expertise

- Program / Project Management
  - Customer Management
  - Scope / Change Management
  - Financial Management
  - Risk Management / Mitigation
  - Software Implementation
  - Training
  - Staff Development
  - Business Analysis
  - Executive Presentations
- 

### Technical Skills and Experience

- CampusVue and CampusNexus Student
  - Portal
  - Integrations
  - CRM
  - Business Intelligence
  - Data Warehousing
  - Microsoft Office
  - Microsoft Project
- 

### Project Experience

- 8 Years Project Management Experience with CampusVue and CampusNexus Student, Portal and Integrations
  - 12 Years of Implementation and Consulting Experience
- 

### Education and Certifications

- Master of Business Administration, University of Phoenix
  - Bachelor of Science in Information Technology, University of Phoenix
  - Certified Project Management Professional (PMP®)
-

# Maureen H. Bryan

## Principal Project Manager

---

### Summary

Maureen joined Campus Management Corporation in 2009 after extensive project management consulting in industries such as; insurance, software, travel, and logistics. Since joining CMC, she has led the implementation of CampusVue® Student and other products at traditional universities and multi-campus career colleges. In her current position as Principal Project Manager, Maureen is responsible for ensuring the successful implementation of all aspects of CampusVue Student, CampusVue Portal, CampusVue Integration and Talisma CRM projects.

Maureen is a key member of the Practice Management team which manages the product implementations for both new and existing customers. She uses her wealth of project management experience to onboard new project managers, to coach team members, and to deliver internal prep classes for PMP certification. Maureen also works with the CMC Sales team quoting implementation services for pre-sales opportunities.

---

### Areas of Expertise

- Program / Project Management
- Customer Management
- Scope / Change Management
- Financial Management
- Risk Management / Mitigation
- Software Implementation
- Training
- Staff Development
- Business Analysis
- Executive Presentations

---

### Technical Skills and Experience

- CampusVue Student
- CampusVue Portal
- CampusVue Integrations
- Talisma CRM
- Business Intelligence
- Data Warehousing
- Microsoft Office
- Microsoft Project

---

### Project Experience

- 4 Years Project Management Experience with CampusVue Student, Portal and Integrations
- 1 Year Project Management Experience with Talisma CRM
- 20 Years of IT Project Management, Implementation and Consulting Experience

---

### Education and Certifications

- Master of Business Administration, Barry University
- Bachelor of Science in Mathematics with a Computer Science minor, Loyola University
- Certified Project Management Professional (PMP®)

# Caroline Singletary

## Professional Services – Service Delivery Manager

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### Summary

Caroline joined Campus Management Corporation in 2003. During this time she has held various positions in Product Development such as QA, BA, Requirements and Documentation Manager and Director of Product Development Solutions. She moved to Professional Services in January of 2013 as a Service Delivery Manager of SIS in Professional Services. Caroline provides leadership for a team of remote Implementation Consultants, oversees process improvement projects, ensures quality assurance on implementation projects and develops new service delivery offerings. Her team is responsible for the implementation delivery of CMC applications for the Student Information System and Portal to CMC customers. She has overseen the implementation of the Campus Management suite of products (CampusVue SIS, Portal, Formsbuilder, etc) for not-for-profit, faith based colleges and universities, as well as multi-campus career colleges.

Caroline is certified as both a Project Management Professional (PMP) and Pragmatic Marketing Certified (PMC) and has an MBA in International Business.

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### Areas of Expertise

- Proven ability to manage software implementations for small and large institutions
- Consistent commitment to high customer satisfaction
- Strong process and quality background across various methodologies
- Program / Project Management
- Scope / Change Management
- Risk Management / Mitigation
- Software Implementation
- Staff Development
- Business Analysis

---

## Technical Skills and Experience

Proficient with PC computers, Windows Operating System, Microsoft Office Professional Suite, Microsoft Visio, Microsoft Project, Net Suite Open Air, Internet Explorer and various browsers, Sharepoint, Software and business requirements elicitation and documentation

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## Project Experience

Caroline is a leader in the Professional Services department, and plays a direct role in managing people, processes, customer escalations and ensuring overall implementation project quality. Her primary duty is to provide training, coaching and mentoring to direct reports in order to optimize performance, productivity and service quality. She is responsible for identifying resource allocations, schedule management, project team composition and overseeing the deployment of Campus Management solutions to customers.

Caroline's experience at Campus Management started in 2003 and includes indepth knowledge of both the software development lifecycle and implementation lifecycle including quality control processes, requirements elicitation and documentation, technical documentation, project management, resource management, release management and implementation management. She has held several leadership positions at Campus Management Corporation in Development and Professional Services. She has experience with a variety of clients including not-for-profit, faith based colleges and universities, as well as multi-campus career colleges.

---

## Education and Certifications

Masters in Business Administration in International Business Florida Atlantic University, Boca Raton, Florida

Bachelor of Science in Management Information Systems Florida Atlantic University, Boca Raton, Florida

Project Management Professional (PMP) Certification 302158, Project Management Institute

# James Bennett

## Implementation Consultant

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### Summary

James joined Campus Management Corporation in 2007, with over 20 years of engineering, planning, consulting and training in general industry with companies like General Dynamics, AT&T, MCI, SPRINT, Shell, Texaco, Merlin Gerin and APC. Since joining CMC, he has led the implementation of CampusVue® Portal, E-Learning, Forms Builder and other products that support over 500 campuses, colleges and universities. In his current position James is responsible for ensuring the successful implementation of all aspects of CampusVue Portal and CampusVue Forms Builder.

James is a key member of the Implementation team, working with the product implementations for both new and existing customers. He uses his wealth of Campus Management experience to onboard and train new implementation consultants, to coach team members, and to deliver assigned projects on-time and budget.

---

### Areas of Expertise

- Customer Management
- Risk Management / Mitigation
- Infrastructure Analysis
- Software Implementation
- Consultant Training
- Staff Development
- Business Analysis
- Executive Presentations

---

### Technical Skills and Experience

- CampusVue Student
- CampusVue Portal
- CampusVue Forms Builder
- CampusVue SharePoint Integration
- Microsoft Office
- Microsoft Project

---

### Project Experience

- 8 Year Implementation Experience with CampusVue Student, Portal and Integrations
- 2 Year Implementation Experience with CampusVue Forms Builder
- Over 20 Years of Implementation and Consulting Experience

---

### Educational Background

- Master of Business Administration, National University
- Bachelor of Science in Logistics Management, Weber State University

# Rhonda Kilgore

## Solutions Architect

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### Summary

Rhonda has extensive Higher Education experience at several colleges with a variety of missions including a four year small private college, a large state supported university, a technical college, and a military college. She has also worked at SunGard Higher Education and Oracle. Rhonda has almost thirty years of Higher Education experience. One of her specialties is capturing, analyzing, and implementing business requirements for successful translation into software applications in the Implementation Lifecycle. She has completed numerous Student Information System implementations. Rhonda has also served as Product Strategist and has a keen interest in industry organizations for keeping current with new trends and solution approaches.

Rhonda joined Campus Management Corp. with the primary responsibility to implement and support enterprise level clients. She has a high level of customer satisfaction because of her ability to work effectively with a variety of publics.

---

### Areas of Expertise

Higher Education ERP Implementations

Overall ecosystem expertise including in depth Financial Aid experience

Proven results through dedication and analytical skills

Excellent interpersonal, communication, and documentation skills

Campus Management specific experience since 2010

Industry speaker

Partnership Management

Federal Regulations

Product Management

Product Strategy

---

## Technical Skills and Experience

Proficient with Personal Computers, Windows Operating System, Microsoft Office Professional Suite (Visio, Excel, Word), Internet Explorer, EDEpress, EDConnect, and Social Networks

Detailed knowledge of and experience with several ERP solutions for Higher Education

Product Requirements gathering and documentation

ERP Implementation Planning and Software Development Methodologies

---

## Project Experience

Solutions Architect for Campus Management's CampusVue Student system at a large, complex private university with focus on Financial Aid Automation implementation.

Solutions Architect for Health Check analysis at a large For Profit institution in California. Project included analysis of all student system modules and recommendation for all ecosystem solution add-on implementation timelines, presenting recommendations to executive management, obtaining buy-in and completing Centralized Financial Aid business model execution successfully on time and within budget.

Solutions Architect for new Common Origination & Disbursement conversion methodology. Project included initial data analysis, conversion methodology, and detailed Go Live analysis for smooth transition to CampusVue Student.

Solutions Architect for three successful transitions from Servicer based processing to School based processing of federal aid.

Solutions Architect for various Account Management assignments including Student Accounts Billing Methods and Revenue Recognition, Academic Records Satisfactory Academic Progress, Student Privacy Rights solution (FERPA), complete Security analysis and migration of newly defined Staff Groups at a large For Profit institution in Florida.

---

## Education and Certifications

Charleston Southern University, Bachelor of Science, Business Administration, Concentration in Management, Minor in English.

## **Data Services**

The Campus Management Corp. professional services team members mentioned in this section can perform the required data services for the implementation. Résumés begin on the next page.

# Roman Civalero

## Data Services Service Delivery Manager

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### Summary

Roman joined Campus Management Corporation in 2002 after working in the financial imaging industry. Since joining CMC, he quickly excelled in the Client Services department and transferred to Data Services in 2004 as a conversion specialist. Throughout the last 10 years Roman has played an integral part in many successful data conversion and special projects.

Roman is currently the Data Services Service Delivery Manager and is a key member of the Campus Management Management team which manages the product implementations for both new and existing customers in regards to Data Conversion and Reporting Services.

---

### Areas of Expertise

- Program / Project Management
  - SQL Server/ SQL Programming
  - Reporting Services
  - Business Solution
  - Data Conversion Methodologies
- 

### Technical Skills and Experience

- CampusVue Student
  - SQL Server
  - SQL Programming / SSIS
  - Crystal Reports
  - Microsoft Office
  - Microsoft Project
- 

### Project Experience

- 1 Year Project Management Experience with CampusVue Student.
  - 9 Years Data Conversion Experience.
  - 2 Years of Client Services Experience
- 

### Education and Certifications

- Bachelor of Science in Information Technology, University of Florida
-

# Jessica Flint

## Data Services Senior Technical Analyst

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### Summary

Jessica joined Campus Management Corporation in 2007 after several years as an Application database programmer and report writer. Since joining CMC, she has worked on data migrations for different implementations taking the projects from the early stages of data analysis and validation all the way to Go-Live. She has also worked on data cleanup, custom reports and as a trainer and curriculum writer for classes at our annual user's conference. Jessica is bilingual in English and Spanish and has been able to utilize those skills on international Higher Education projects.

Jessica is a key member of the Integrations - Data Services team which manages all data related activities such as integrations, conversions/migrations, reporting, cleanups, etc. Jessica's solution oriented experience plus her high energy and enthusiasm make her a great resource to our team.

---

### Areas of Expertise

- Business Analysis
  - Requirement gathering
  - Technical Training
  - Trouble shooting errors
- 

### Technical Skills and Experience

- CampusVue Student
  - Database design and programming
  - Data Warehousing
- 

### Project Experience

- 10+ years of database programming with SQL server
  - 10+ years of Crystal Reports development
  - CampusVue Student
- 

### Education and Certifications

- Bachelor of Arts Business Administration, Sacred Heart University
  - Graduated Magna Cum Laude
-

**Item 9: Certificate of Insurance**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.



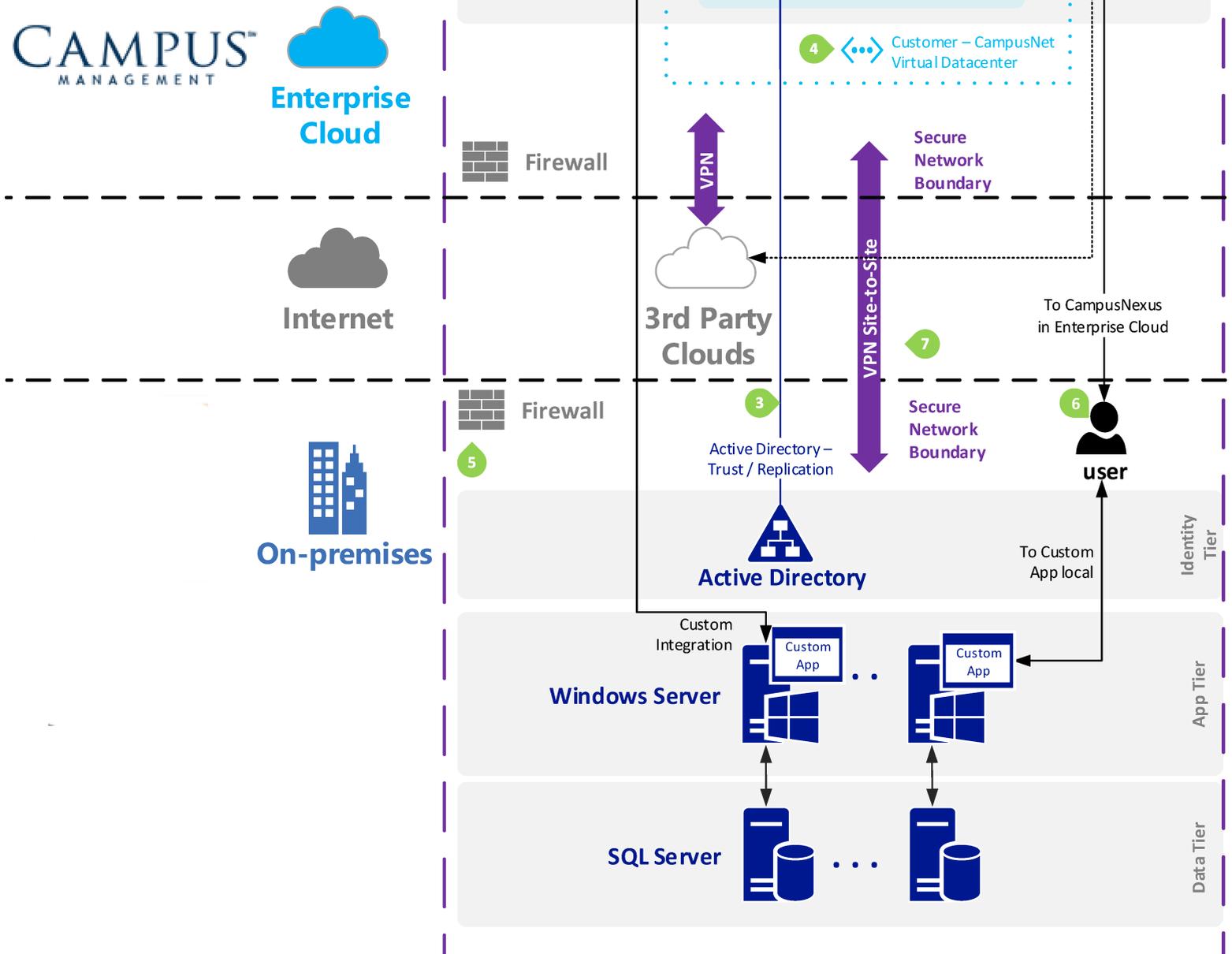
**Item 10: CampusNet Enterprise Cloud Diagram**

Francis Marion University, this is an index page that is required by this Attachment document's table of contents. The actual document for this section starts on the next page.

# CampusNexus™ extensibility from the CampusNet Enterprise Cloud

Gain operational efficiencies without re-architecting your applications by moving them to the CampusNet Enterprise Cloud using Infrastructure as a Service (IaaS). Take advantage of this flexible resource and build new applications and integrations with complete control, access, and connectivity to your data.

- 1 CampusNexus™ is deployed using best practices by the CampusNet engineering team. Users access application through Citrix published applications or through Web Portals. Access your applications. Directly access API services via Internet for partners or direct for custom integrations (HTTPS). You have full access and control of how you leverage them to build your custom integrations.
- 2 Your data layer managed and protected in the to the Enterprise Cloud for the lowest latency and highest performance. Take advantage of all high performance flash based storage and high availability architecture.
- 3 Active Directory (AD) domain controllers and DNS servers in CampusNet Enterprise Cloud synchronize these services with your on-premises AD domain controllers. Users can now authenticate using their existing on-premises IDs for a Single Sign On (SSO) experience.
- 4 Connect all your virtual machines in the Enterprise Cloud with the high-speed CampusNet Virtual Network.
- 5 Connect on-premises to the Enterprise Cloud with a permanent Site-to-Site VPN over the Internet.
- 6 On-premises users now access their applications in the Enterprise Cloud with no changes to the user experience.
- 7 The applications in the CampusNet Enterprise Cloud, third-party clouds, and on-premises can securely communicate and exchange data.



## Disclosure Statement

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