



QAD Adaptive Applications

# Technical Reference Hardware and Software Requirements

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QAD EQMS 2025

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QAD Inc.

100 Innovation Place

Santa Barbara, CA 93108

Phone: +1 (805) 566-6100

<http://www.qad.com>

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|  |           |
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|  | <b>1</b>  |
| <b>Copyright</b> .....                                     | <b>2</b>  |
| <b>Chapter 1: Hardware and Software Requirements</b> ..... | <b>6</b>  |
| <b>Overview</b> .....                                      | <b>7</b>  |
| <b>Network Topology Standards and Requirements</b> .....   | <b>7</b>  |
| <b>Server Hardware and Software Requirements</b> .....     | <b>7</b>  |
| Hardware Requirements .....                                | 8         |
| CCU .....  | 8         |
| Production .....   | 8         |
| Development/Test .....                                     | 8         |
| Software Requirements .....                                | 9         |
| Web (Application) Server Requirements .....                | 9         |
| Notes .....  | 9         |
| Database Server Requirements .....                         | 11        |
| Notes .....  | 11        |
| <b>Client Hardware and Software Requirements</b> .....     | <b>12</b> |
| Hardware Requirements .....                                | 12        |
| Client Requirements .....                                  | 12        |
| Notes .....  | 12        |
| Software Requirements .....                                | 13        |
| Client Requirements .....                                  | 13        |
| Notes .....  | 13        |
| <b>Technical Installation Checklist</b> .....              | <b>14</b> |
| Production .....   | 14        |
| Development/Test .....                                     | 14        |
| Customer IT .....  | 15        |
| Integration .....  | 16        |
| <b>Chapter 2: Required IIS Features</b> .....              | <b>17</b> |

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|  |           |
|--|-----------|
| <b>Required IIS Features</b> .....                         | <b>18</b> |
| Windows Server (IIS) Versions .....                        | 18        |
| Required Features .....                                    | 18        |
| <b>Chapter 3: Setting Up and Troubleshooting DTC</b> ..... | <b>19</b> |
| <b>Introduction</b> .....                                  | <b>20</b> |
| <b>What is Required for DTC?</b> .....                     | <b>20</b> |
| Configuring DTC to Work Through a Firewall .....           | 20        |
| Firewall Configuration .....                               | 20        |
| Configuring the Servers .....                              | 20        |
| <b>What Are Some Common Problems?</b> .....                | <b>21</b> |
| Security Isn't Configured Correctly for DTC .....          | 21        |
| Windows Firewall Doesn't Allow DTC Traffic .....           | 22        |
| A Cloned VM Has Duplicated CIDs .....                      | 23        |

# Hardware and Software Requirements Technical Reference Change Summary

The following table summarizes significant differences between this document and previous versions.

| <b>Date/Version</b> | <b>Description</b>   | <b>Reference</b> | <b>Changed By</b> |
|---------------------|--|------------------|-------------------|
| APR 2021/v2021      | Initial upload   | --               | FFV               |
| SEPT 2021/v2021.1   | Updated versioning;<br>Added software requirements                                     | p. 9             | FFV               |
| MAR 2022/v2022      | Updated software requirements;<br>Updated required IIS features                        | p. 9, p. 18      | FFV               |
| SEPT 2022/v2022.1   | Updated versioning;<br>Updated software requirements                                   | p. 9             | FFV               |
| MAR 2023/v2023      | Updated versioning   | --               | FFV               |
| MAR 2024/v2024      | Updated versioning;<br>Updated software requirements;<br>Updated required IIS features | p. 9, p. 18      | FFV               |
| SEPT 2024/v2024.1   | Updated versioning;<br>Updated software requirements                                   | p. 9             | FFV               |
| MAR 2025/v2025      | Updated versioning;<br>Removed Dot Net 6 requirement;<br>Updated Node JS versioning    | p. 9, p. 11      | FFV               |

# Chapter 1

## Hardware and Software Requirements

*Overview...7*

*Network Topology Standards and Requirements...7*

*Server Hardware and Software Requirements...7*

*Hardware Requirements...8*

*Software Requirements...9*

*Client Hardware and Software Requirements...12*

*Hardware Requirements...12*

*Software Requirements...13*

*Technical Installation Checklist...14*

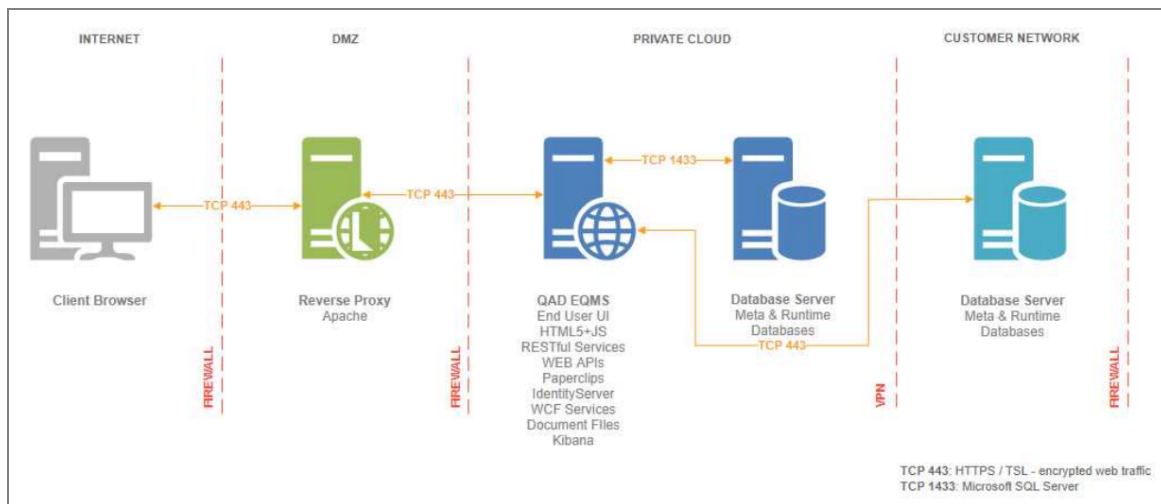
## Overview

All hardware specifications in this document are **minimum requirements** for a single instance of QAD EQMS. These specifications assume that each server component (IIS and SQL Server) is installed on its own dedicated server. Combining these server components (or multiple QAD EQMS software instances) on a single server will negatively impact performance and require additional hardware resources to run appropriately.

If additional concurrent users are using the system additional resources will be required. Similarly, if the servers are used for applications or purposes outside of dedicated hosting of QAD EQMS, the server resource requirements should be scaled accordingly.

## Network Topology Standards and Requirements

The standard network configuration for QAD EQMS is to have the application server and the database server within the private Cloud network. A reverse proxy server would be installed within the DMZ serving as a pass-through between public internet traffic and the QAD EQMS application. This configuration allows for access to the QAD EQMS without the need for a VPN while maintaining security. Additionally, this configuration allows for encrypted integration between the customer's network and QAD EQMS over TSL and the private VPN.



## Server Hardware and Software Requirements

To be reviewed by the customer's IT department.

**Purpose:** So the customer's IT department is aware of the **minimum requirements** for the installation and support of QAD EQMS. If any of the following requirements are lacking, QAD EQMS cannot be installed.

## Hardware Requirements

| CCU    | <b>Production</b><br><br><b>Production servers must be dedicated to production.</b>   | <b>Development/Test</b><br><br>Development and test servers can be combined but must be separated from production.   |
|--------|---|--|
| 10-60  | <b>Web (IIS) Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [60 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [16 GB]</li> </ul>       | <b>Web (IIS) Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [60 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [16 GB]</li> </ul>      |
|        | <b>Database (SQL) Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [60 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [16 GB]</li> </ul>  | <b>Database (SQL) Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [60 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [16 GB]</li> </ul> |
|        | <b>Proxy Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [40 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [8 GB]</li> </ul>            | <b>Proxy Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [40 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [8 GB]</li> </ul>           |
| 61-125 | <b>Web (IIS) Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [120 GB]</li> <li>• Processor [2 CPUs (8 cores total)]</li> <li>• Memory [32 GB]</li> </ul>      | <b>Web (IIS) Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [60 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [16 GB]</li> </ul>      |
|        | <b>Database (SQL) Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [120 GB]</li> <li>• Processor [2 CPUs (8 cores total)]</li> <li>• Memory [32 GB]</li> </ul> | <b>Database (SQL) Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [60 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [16 GB]</li> </ul> |
|        | <b>Proxy Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [40 GB]</li> <li>• Processor [2 CPUs (8 cores total)]</li> <li>• Memory [8 GB]</li> </ul>            | <b>Proxy Server</b> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [40 GB]</li> <li>• Processor [2 CPUs (8 cores total)]</li> <li>• Memory [8 GB]</li> </ul>           |

| CCU     | Production   | Development/Test  |
|---------|--|---|
| 126-150 | <p><b>Production servers must be dedicated to production.</b></p> <p><b>Web (IIS) Server</b></p> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [220 GB]</li> <li>• Processor [2 CPUs (8 cores total)]</li> <li>• Memory [64 GB]</li> </ul> <p><b>Database (SQL) Server</b></p> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [220 GB]</li> <li>• Processor [2 CPUs (8 cores total)]</li> <li>• Memory [64 GB]</li> </ul> <p><b>Proxy Server</b></p> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [40 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [8 GB]</li> </ul> | <p>Development and test servers can be combined but must be separated from production.</p> <p><b>Web (IIS) Server</b></p> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [60 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [16 GB]</li> </ul> <p><b>Database (SQL) Server</b></p> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [60 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [16 GB]</li> </ul> <p><b>Proxy Server</b></p> <ul style="list-style-type: none"> <li>• Hard Drive Free Space [40 GB]</li> <li>• Processor [2 CPUs (4 cores total)]</li> <li>• Memory [8 GB]</li> </ul> |

## Software Requirements

| Web (Application) Server Requirements   | Notes  |
|---|--|
| <p><b>The following requirements apply to production, dev, and test servers.</b></p> <p><b>Web Server 64-bit</b></p> <p>Supported Operating Systems:</p> <ul style="list-style-type: none"> <li>• Microsoft Windows Server 2016</li> <li>• Microsoft Windows Server 2019</li> </ul> | <p>Standard, Enterprise, or Data Center Editions are supported.</p> <p>Both virtual servers and physical servers are supported.</p>  |
| <p><b>Microsoft Internet Information Services</b></p> <p>Supported Versions:</p> <ul style="list-style-type: none"> <li>• IIS 10</li> </ul> <p>Required Features: See Appendix</p>  | <p>IIS is included in the Windows Server operating system and can be enabled through Server Roles.</p> <p>All versions of IIS included in the Supported Operating Systems list by default are supported.</p> |
| <p><b>Frameworks</b></p> <ul style="list-style-type: none"> <li>• Microsoft .Net Framework version 4.7.2</li> <li>• Microsoft .Net 8.0.3 Hosting Bundle Runtime</li> </ul>  |  |

| <b>Web (Application) Server Requirements</b>   | <b>Notes</b>   |
|--|--|
| <p><b>The following requirements apply to production, dev, and test servers.</b></p> |  |
| <p><b>TCP/IP</b></p>   | <p>The TCP/IP protocol must be available. IIS and SQL by default will communicate through port 1433.</p>   |
| <p><b>SSL Certificate</b></p>  | <p>All QAD EQMS traffic takes place over the SSL/TLS protocol and therefore requires that a Digital Certificate be assigned. This certificate must be through a Certificate Authority (self-signed certificates will not work) and should be installed / imported on the IIS server.</p> <p><b>SPECIAL NOTE ON CERTIFICATES:</b></p> <p>Self-signed certificates will not work for QAD EQMS. A true CA signed certificate is required.</p> <p>There are a number of transactions within QAD EQMS that require an intermediate certificate to ensure a proper trust-chain and an added level of security. These intermediate certificates are only available through true CA signed certificates.</p> <p>Because a proper certificate authority requires a registered public domain to sign against, and IIS will not allow a certificate to be assigned that doesn't match the site's domain, it is also a subsequent requirement that the EQMS website is given an FQDN (fully qualified domain name) with a registered domain. The site, however, does not need to be publicly accessible.</p> <p><i>Additionally, using self-signed certificates, even on internal sites, poses security risks. Even browsers (especially the more security conscious browsers like Chrome) will warn the user that the site is insecure. This can lead to bad behavior (working around/past the warning), but there's still the risk that if a hacker finds a way in, the lack of a proper certificate can be exploited.</i></p> |

| Web (Application) Server Requirements  | Notes   |
|--|---|
| <p><b>The following requirements apply to production, dev, and test servers.</b></p>   |   |
| <p><b>DNS Record for the QAD EQMS Site</b></p>   | <p>Because QAD EQMS is a web application, it must be given a URL and a corresponding DNS record in order for users to access it. Multiple URL's are required for mutliple environments. Examples:</p> <ul style="list-style-type: none"> <li>• <i>https://eqms.yourcompanydomain.com</i></li> <li>• <i>https://eqms-dev.yourcompanydomain.com</i></li> <li>• <i>https://eqms-test.yourcompanydomain.com</i></li> </ul> <p><i>Not required if hosted in the QAD Cloud.</i></p> |
| <p><b>SQL Server Feature Pack</b></p> <p><b>For the corresponding version of SQL Server installed.</b></p> <ul style="list-style-type: none"> <li>• SqlDom.msi</li> <li>• SharedManagementObjects.msi</li> <li>• SQLSysClrTypes.msi</li> <li>• DACFramework.msi</li> </ul> | <p>Required for QAD EQMS installation tool on the Web Server to communicate update scripts to the SQL Server.</p>   |
| <p><b>NodeJS Runtime</b></p> <p><b>Supported version:</b></p> <ul style="list-style-type: none"> <li>• 20.17.0</li> </ul>  | <p>Library required for reading expressions.</p>  |

| Database Server Requirements   | Notes   |
|--|---|
| <p><b>The following requirements apply to production, dev, and test servers.</b></p>   |   |
| <p><b>Windows Server 64-bit</b></p> <p>Supported Operating Systems:</p> <ul style="list-style-type: none"> <li>• Microsoft Windows Server 2016</li> <li>• Microsoft Windows Server 2019</li> </ul> | <p>Standard, Enterprise, or Data Center Editions are supported.</p> <p>Both virtual servers and physical servers are supported.</p>   |
| <p><b>Microsoft SQL Server</b></p> <p>Supported Versions:</p> <ul style="list-style-type: none"> <li>• Microsoft SQL Server 2019</li> </ul>  | <p>Microsoft SQL Standard, Enterprise, and Business Intelligence Editions are supported.</p> <p>Microsoft SQL Enterprise Edition is required for TDE support.</p> <p><b>Microsoft SQL Express Edition is not supported due to hardware resource restrictions.</b></p> |
| <p><b>Microsoft SQL Management Studio</b></p>  | <p>Required for database installation and management.</p>   |

| Database Server Requirements  | Notes   |
|---|---|
| <b>The following requirements apply to production, dev, and test servers.</b> |   |
| <b>TCP/IP</b>   | The TCP/IP protocol must be available. IIS and SQL by default will communicate through port 1433. |

## Client Hardware and Software Requirements

### Hardware Requirements

| Client Requirements  | Notes |
|--|-------|
| <b>The following requirements apply to running against production, dev, and/or test sites.</b>   |       |
| <b>Desktop / Laptop</b> <ul style="list-style-type: none"><li>• Hard Drive Free Space [10 GB]</li><li>• Processor [2 cores, 2 GHz]</li><li>• Memory [4 GB]</li></ul> |       |
| <b>Mobile</b><br>Supported Devices <ul style="list-style-type: none"><li>• iPhone</li><li>• iPad</li><li>• Android Phones</li><li>• Android Tablets</li></ul>        |       |

## Software Requirements

| Client Requirements   | Notes  |
|---|--|
| <p><b>The following requirements apply to running against production, dev, and/or test sites.</b></p>   |  |
| <p><b>Desktop / Laptop</b></p> <p>Supported Client Operating Systems:</p> <ul style="list-style-type: none"> <li>• All operating systems that support the browsers listed below and recommended hardware requirements.</li> </ul> <p>Supported Browsers</p> <ul style="list-style-type: none"> <li>• Edge 12+</li> <li>• Firefox 41+</li> <li>• Chrome 46+</li> <li>• Safari 9+</li> <li>• iOS Safari 9+</li> <li>• Chrome for android 46+</li> </ul> |  |
| <p><b>Mobile</b></p> <p>Supported Devices</p> <ul style="list-style-type: none"> <li>• iPhone</li> <li>• iPad</li> <li>• Android Phones</li> <li>• Android Tablets</li> </ul>   | <p>With new mobile devices, operating systems, and browsers being released every day, it is not possible to pre-validate each possible combination. In theory, however, the mobile version of QAD EQMS will run in any browser that supports HTML5. Private/Incognito browsing is not supported.</p> |

## Technical Installation Checklist

To be completed by the customer's IT department.

|                  |                    |
|------------------|--------------------|
| Customer Name:   |                    |
| IT Contact Name: | IT Contact Number: |

**Purpose:** To collect information about the systems in which QAD EQMS will be installed and to reduce the possibility of exceptions during the installation and configuration of the system.

| Production   | Development/Test   |
|--|--|
| <b>Production servers must be dedicated to Production.</b>   | Development and test servers can be combined but must be separated from production.  |
| Web (IIS) Server <ul style="list-style-type: none"> <li>• Name: [ ]</li> <li>• Operating System: [ ]</li> <li>• Hard Drive Free Space [ ]</li> <li>• Processor (include speed and total number of cores): [ ]</li> <li>• Memory: [ ]</li> <li>• Preferred Drive: [ ]</li> </ul>  | Web (IIS) Server <ul style="list-style-type: none"> <li>• Name: [ ]</li> <li>• Operating System: [ ]</li> <li>• Hard Drive Free Space [ ]</li> <li>• Processor (include speed and total number of cores): [ ]</li> <li>• Memory: [ ]</li> <li>• Preferred Drive: [ ]</li> </ul>  |
| SQL Server<br>(This component must be separate from the IIS Server) <ul style="list-style-type: none"> <li>• Name: [ ]</li> <li>• Operating System: [ ]</li> <li>• Hard Drive Free Space [ ]</li> <li>• Processor (include speed and total number of cores): [ ]</li> <li>• Memory: [ ]</li> <li>• Preferred Drive: [ ]</li> </ul> | SQL Server<br>(This component must be separate from the IIS Server) <ul style="list-style-type: none"> <li>• Name: [ ]</li> <li>• Operating System: [ ]</li> <li>• Hard Drive Free Space [ ]</li> <li>• Processor (include speed and total number of cores): [ ]</li> <li>• Memory: [ ]</li> <li>• Preferred Drive: [ ]</li> </ul> |
| SMTP Mail Server <ul style="list-style-type: none"> <li>• Email Server Version: [ ]</li> <li>• SMTP Host Address (IP or DNS) [ ]</li> </ul>  | SMTP Mail Server <ul style="list-style-type: none"> <li>• Email Server Version: [ ]</li> <li>• SMTP Host Address (IP or DNS) [ ]</li> </ul>  |
| LDAP/Active Directory<br>(Only if LDAP authentication is intended to be used in the QAD EQMS software) <ul style="list-style-type: none"> <li>• LDAP Server Name: [ ]</li> </ul>   | LDAP/Active Directory<br>(Only if LDAP authentication is intended to be used in the QAD EQMS software) <ul style="list-style-type: none"> <li>• LDAP Server Name: [ ]</li> </ul>   |

|   |              |             |
|---|--------------|-------------|
| <b>Customer IT</b>  |              | ✓           |
| <p><b>Please check off that the following pre-requisites have been completed. If any pre-requisites are not completed, the install cannot be performed.</b></p>   |              |             |
| <p>ASP.NET and all of its features must be enabled feature for the IIS Role/Component. (Server Manager -&gt; Add Roles and Services -&gt; Application Development Role)</p>   |              |             |
| <p>All QAD EQMS traffic takes place over the SSL/TLS protocol and therefore requires that a Digital Certificate be assigned. This certificate must be through a Certificate Authority (self-signed certificates will not work ) and should be installed/imported on the IIS server.</p>   |              |             |
| <p>Using the Utility found here, <a href="https://www.nartac.com/Products/IISCrypto">https://www.nartac.com/Products/IISCrypto</a>, navigate to the Templates section on the right-hand side, open the drop-down and select "Best Practices", and click Apply. This will set the serer to use best practices for TLS.</p>   |              |             |
| <p>A Local Administrator service account must be created on the Web Server. This account will run as the Application Pool identity and will need Full Control over the QAD EQMS Site files.</p> <p>If documents are stored on a server other than the Web Server, the account must be a domain service account, which has permissions over the other server document's directories.</p>   |              |             |
| <p>VPN access and ability to make remote connections to the QAD EQMS application and its supporting servers is required during the implementation phase for the following reasons:</p> <ul style="list-style-type: none"> <li>• QAD EQMS Product Installation</li> <li>• Professional Services software configurations</li> <li>• Technical Support</li> </ul>  |              |             |
| <b>Name</b>   | <b>Email</b> | <b>Role</b> |
|   |              |             |
|   |              |             |
|   |              |             |
| <p><b>** Lack of VPN access will cause lengthy delays in multiple areas throughout the implementation phase of your project. If VPN access cannot be provided then QAD Technical Support and Professional Services will need access to the Servers through QAD provided Gotoassist/Gotomeeting sessions on an as-needed basis.</b></p>  |              |             |
| <p>Please ensure QAD Representatives will have access to the SQL Server to perform various technical services. We will need to be able to use the SQL Server Management Studio.</p> <p>Additionally, for the purpose of troubleshooting errors in IIS, support personnel will need an account that has access to the Windows Event Viewer. This account needs permission on any server that has QAD EQMS installed on it, including servers inside and outside the DMZ.</p> |              |             |

|   |   |
|---|---|
| <b>Customer IT</b>  | ✓ |
| <b>Please check off that the following pre-requisites have been completed. If any pre-requisites are not completed, the install cannot be performed.</b>              |   |
| Please specify the URL that will be used to access this application. Proper DNS records will need to be set up for the Web Server prior to installation for this URL. |   |

|  |   |
|--|---|
| <b>Integration</b>   | ✓ |
| <b>Please check off that the following pre-requisites have been completed, if integration services are needed.</b> |   |
| Required ODBC Drivers must be installed on the IIS/Web Server.   |   |
| Required ODBC connections and parameters must be set up on the IIS/Web Server.                                     |   |
| **Assistance for queries from data sources may be required.  |   |

**Please email back to (QAD rep)@qad.com.**

## **Chapter 2**

# **Required IIS Features**

*Required IIS Features...18*

## Required IIS Features

| Windows Server (IIS) Versions          | Required Features  |
|--|--|
| Windows Server 2016 (IIS Version 10.0) | <ul style="list-style-type: none"> <li>• General               <ul style="list-style-type: none"> <li>• DAC Framework</li> <li>• .Net Framework 4.7.2</li> <li>• SQL Clear Types</li> <li>• SQL Dom</li> <li>• SQL Shared Management Objects</li> <li>• SSL Cert for all environments (Requires Customer to Install)</li> <li>• TCP Port Sharing</li> <li>• Web Server (IIS) Support</li> </ul> </li> <li>• Common HTTP Features               <ul style="list-style-type: none"> <li>• Default Document</li> <li>• Directory Browsing</li> <li>• HTTP Errors</li> <li>• HTTP Redirection</li> <li>• Static Content</li> </ul> </li> <li>• Health and Diagnostics               <ul style="list-style-type: none"> <li>• HTTP Logging</li> <li>• Logging Tools</li> <li>• Request Monitoring</li> </ul> </li> <li>• Performance               <ul style="list-style-type: none"> <li>• Static Content Compression</li> <li>• Dynamic Content Compression</li> </ul> </li> <li>• Security               <ul style="list-style-type: none"> <li>• Request Filtering</li> <li>• Basic Authentication</li> <li>• Client Certificate Mapping Authentication</li> <li>• Digest Authentication</li> <li>• IIS Client Certificate Mapping Authentication</li> <li>• IP and Domain Restrictions</li> <li>• URL Authorization</li> <li>• Windows Authentication</li> </ul> </li> <li>• Application Development               <ul style="list-style-type: none"> <li>• .Net Extensibility 4.5</li> <li>• Application Initialization</li> <li>• ASP .NET 4.5</li> <li>• ISAPI Extensions</li> <li>• ISAPI Filters</li> </ul> </li> <li>• Management Tools               <ul style="list-style-type: none"> <li>• IIS Management Console</li> <li>• IIS Management Scripts and Tools</li> </ul> </li> </ul> |

## **Chapter 3**

# **Setting Up and Troubleshooting DTC**

*Introduction...20*

*What is Required for DTC?...20*

*Configuring DTC to Work Through a Firewall...20*

*Firewall Configuration...20*

*Configuring the Servers...20*

*What Are Some Common Problems?...21*

*Security Isn't Configured Correctly for DTC...21*

*Windows Firewall Doesn't Allow DTC Traffic...22*

*A Cloned VM Has Duplicated CIDs...23*

## Introduction

DTC (Distributed Transaction Control) or MSDTC (Microsoft Distributed Transaction Control) provides transaction management services for applications. Its goal is to provide transaction management for two or more distinct resources to ensure transactional consistency.

DTC is not used for every QAD EQMS transaction, but it isn't uncommon and is therefore a requirement for QAD EQMS product to function correctly.

## What is Required for DTC?

### Configuring DTC to Work Through a Firewall

DTC uses Remote Procedure Call (RPC) dynamic port allocation. By default, RPC dynamic port allocation randomly selects port numbers above 1024. By modifying the registry, you can control which ports RPC dynamically allocates for incoming communication. You can then configure your firewall to confine incoming external communication to only those ports and port 135 (the RPC Endpoint Mapper port).

### Firewall Configuration

QAD EQMS requires that ports 135 and 5000-5100 are opened bidirectionally between the application server in the DMZ and the database server in the private network. Once the ports are opened on the firewall, the two servers need to be configured to confine the port ranges so that they are choosing ports within the range opened on the firewall. This configuration needs to take place within the registry of both servers and will require reboots once completed.

### Configuring the Servers

Follow these steps to control RPC dynamic port allocation. You will have to do this on the application server as well as the database server.

1. To start Registry Editor, click Start, click Run, type regedt32, and then click OK. You must use Regedt32.exe, rather than Regedit.exe, because Regedit.exe does not support the REG\_MULTI\_SZ data type that is required for the Ports value.
2. In Registry Editor, click HKEY\_LOCAL\_MACHINE in the Local Machine window.
3. Expand the tree by double-clicking the folders named in the following path:

HKEY\_LOCAL\_MACHINE\Software\Microsoft\Rpc

4. Click the RPC folder, and then click Add Key on the Edit menu.
5. In the Add Key dialog box, in the Key Name box, type Internet, and then click OK.
6. Click the Internet folder, and then click Add Value on the Edit menu.
7. In the Add Value dialog box, in the Value Name Box, type Ports.
8. In the Data Type box, select REG\_MULTI\_SEZ, and then click OK.
9. In the Multi-String Editor dialog box, in the Data box, specify the port or ports you want RPC to use for dynamic port allocation, and then click OK.

Each string value you type specifies either a single port or an inclusive range of ports. To open ports 5000 to 5100 inclusive, specify "5000-5100" without the quotation marks. All ports must be in the range of 1024 to 65535. If any port is outside this range or if any string is invalid, RPC will treat the entire configuration as invalid.

Microsoft recommends that you open up ports from 5000 and up, but QAD EQMS recognizes that such a large range proposes a security risk for the Cloud. Therefore, QAD EQMS has limited the range from 5000-5100.

Ports: REG\_MULTI-SZ: 5000-5100

PortsInternetAvailable: REG\_SZ: Y

UseInternetPorts: REG\_SZ: Y

10. Follow steps 6 through 9 to add another key for Internet, by using the following values:

Value: PortsInternetAvailable

Data Type: REG\_SZ

Data: Y

This signifies that the ports listed under the ports value are to be made Internet-available.

11. Restart the computer. When RPC restarts, it will assign incoming ports dynamically, based on the registry values that you have specified.

DTC also requires that you are able to resolve computer names by way of NetBIOS or DNS. You can test whether or not NetBIOS can resolve the names by using ping and the server name (Please note that the Cloud team is not going to allow for pinging from the DMZ into the private Cloud, but the test should show whether the name can be resolved to an IP address). The client computer must be able to resolve the name of the server, and the server must be able to resolve the name of the client. If NetBIOS cannot resolve the names, you can add entries to the LMHOSTS files on the computers.

## What Are Some Common Problems?

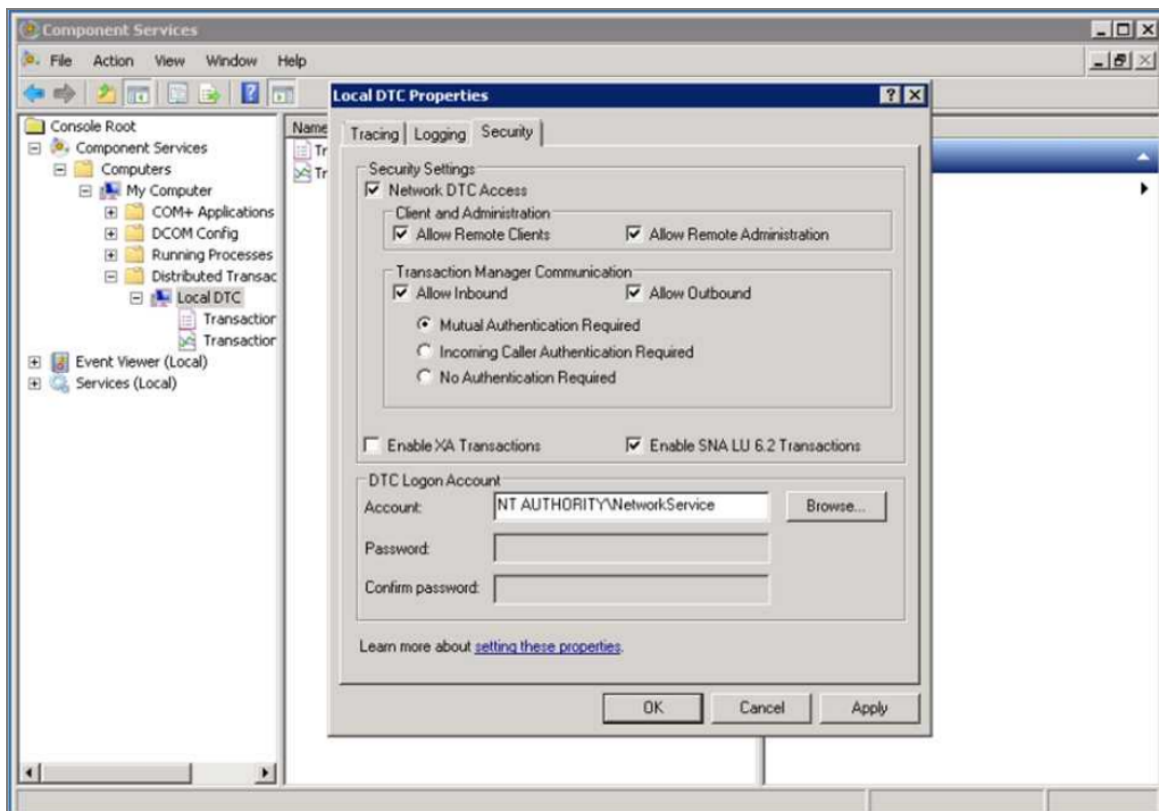
### Security Isn't Configured Correctly for DTC

You can configure the security requirements for distributed transactions in which your computer participates. The default security settings do not allow your computer to participate in remote distributed transactions.

1. Open Component Services (Component Services is no longer in Administrative Tools To open Component Services, click Start menu. In the search box, type dcomcnfg, and then press ENTER).
2. In the Component Services snap-in, expand Computers, My Computer, and Distributed

Transaction Coordinator.

3. Right-click Local DTC, click Properties, and then click the Security tab.
4. Under Security Settings, select the Network DTC Access check box.
5. Under Client and Administration, select the Allow Remote Clients and Allow Remote Administration check boxes.
6. Under Transaction Manager Communication, select the Allow Inbound and Allow Outbound check boxes.
7. Select an authentication level for DTC communications. Mutual Authentication Required is the most secure level.
8. Click OK.



## Windows Firewall Doesn't Allow DTC Traffic

Where Windows Firewall is in use, you must add a firewall exception for the Microsoft Distributed Transaction Coordinator (MS DTC) at each computer that participates in coordinating distributed transactions. To configure this change, use Windows Firewall in Control Panel to enable a firewall exception at each computer in the network running DTCs that require network connectivity.

Membership in Administrators, or equivalent, is the minimum required to complete this procedure. Review details about using the appropriate accounts and group memberships at Local and Domain Default Groups (<http://go.microsoft.com/fwlink/?LinkId=83477>).

To enable a firewall exception for MS DTC using Windows Firewall:

1. Open Windows Firewall.
  - a. To open Windows Firewall, navigate to the Start menu and click Control Panel. In Control Panel, do one of the following:
    - i. Under Security, click Allow a program through Windows Firewall.
    - ii. If Control Panel is in Classic view, click Windows Firewall.
2. On the Exceptions tab, select the Distributed Transaction Coordinator check box.
3. Click OK.

### **A Cloned VM Has Duplicated CIDs**

To correct duplicate CIDs, you must uninstall and reinstall DTC on one of the servers. To reinstall DTC, execute:

1. Run command prompt as Administrator on any cloned server.
2. Run this command: `msdtc -uninstall`
3. Run this command: `msdtc -install`
4. Reboot the server.