

Good Control/Good Proxy Server Installation

Last updated:, 2017
Versions: GC 4.1.xx.yy, GP 4.1.xx.yy



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Contents

Revision history.....	6
BlackBerry Dynamics server installation.....	8
Determining whether you should upgrade to BlackBerry UEM.....	8
Required hardware and software for BlackBerry Dynamics.....	8
Warning: backup before reinstall.....	8
About BlackBerry Dynamics software version numbers.....	9
Variations on deployment configurations.....	9
1. Basic development configuration.....	9
2. Basic distributed servers.....	10
3. Distributed servers + web proxy.....	10
4. Distributed servers + web proxy + Direct Connect.....	10
5. Kerberos constrained delegation.....	10
What's new?.....	11
What was new in release GC 2.1.xx.yy.....	11
BlackBerry Dynamics server/network specifications and deployment configurations.....	13
Microsoft Active Directory RODC not supported.....	13
Software restrictions.....	13
Synchronized time among load balancers, GC, and GP.....	13
Network requirements.....	14
Intranet port configurations.....	14
SSL ciphers between GC and GP servers for Direct Connect.....	14
Opening and checking outbound firewall configurations.....	17
Latency between GC and database: maximum 10 ms.....	20

Email server configuration requirements.....	20
Browser recommendations for GC console.....	20
Installing the BlackBerry Dynamics servers and database.....	20
For POC, install BlackBerry Enterprise Mobility Server on separate server.....	21
Allowable characters in fields in the installation program.....	21
Upgrade or install GC and GP in parallel.....	21
Pre-installation checklist.....	21
Architecture diagram.....	25
Installing the Good Control database.....	25
SQL Server database collation must be case-insensitive.....	26
Setting up Oracle XE database.....	26
Setting up SQL Server database.....	26
Optional: JDBC connection string for SQL mirroring.....	28
Migrating the Good Control database.....	30
Installing the first Good Control server in server cluster.....	32
Required: install or upgrade all servers in the cluster.....	33
About importing enterprise-CA-issued SSL certificates.....	33
Steps.....	33
Installing additional Good Control server in server cluster.....	35
Steps.....	36
Installing Good Proxy server.....	37
About enterprise-CA-issued SSL certificates from Good Control.....	38
Installation steps.....	38
Network setup for GP as "workgroup only".....	42
Installation steps.....	43
Additional Windows configuration: autotuning.....	47
Increasing number of sockets on MS Windows.....	47
Increasing the GC or GP server's Java Heap Size.....	47
BlackBerry device and application management deployment models.....	48
BlackBerry device management and app management installation procedure.....	48

Installing SSL certificates on GC and GP servers.....	49
Cert formats and types.....	49
Before you begin.....	49
Steps.....	49
Installing certificates on the GP server.....	53
Enabling info logging for a GC server.....	53
Decommissioning Good Control or Good Proxy.....	54
Uninstalling the GC or GP server.....	55
High-level steps for upgrading GC or GP.....	55
Earlier releases of BlackBerry Dynamics servers.....	55
Rule of thumb about incremental (or "stepwise") upgrades.....	55
General upgrade steps for each Good Control or Good Proxy cluster.....	56
Restoring custom (enterprise-issued) certificates from backup.....	56
Steps.....	56
BlackBerry Dynamics documentation.....	60

Revision history

BlackBerry Dynamics Server Installation

Date	Description
2017-09-21	Updated with details on multi-subnet mirroring in section "Configuring the JDBC connection string for mirroring and failover" of Optional: JDBC connection string for SQL mirroring
2017-09-19	Determining whether you should upgrade to BlackBerry UEM
2017-07-18	Updated for latest release
2017-02-02	Added important information for upgrading both Good Control and Good Proxy: Restoring custom (enterprise-issued) certificates from backup
2017-01-31	Version numbers updated for latest release; no content changes.
2017-01-03	Added For POC, install BlackBerry Enterprise Mobility Server on separate server with the following note: Note: For POC, the BlackBerry Enterprise Mobility Server (BEMS) must be installed on a server separate from the server for POC of GC, GP, and database.
2016-12-19	Version numbers updated for latest release; no content changes.
2016-11-01	Added detail for necessary network configuration between BES12 and all Good Control servers: open port 443.
2016-09-27	Readded introductory overview Variations on deployment configurations with cross-references to other guides.
2016-08-10	Added updated sizing recommendations in GC Sizing Recommendations: CPUs, Memory, JRE Heap Size, and DB
2016-07-28	Support for Microsoft SQL Server 2014
2016-07-18	All details about required hardware and software for x has been removed from this guide. This information is available in: <ul style="list-style-type: none"> BlackBerry Secure Enterprise Planning Guide BlackBerry Secure Servers Compatibility Matrix
2016-07-07	Added Decommissioning Good Control or Good Proxy
2016-07-01	Updated for latest release: <ul style="list-style-type: none"> Determining whether you should upgrade to BlackBerry UEM: new materials available SQL Server database collation must be case-insensitive During upgrade, automatic backup of Good Control files and SQL Server DB
2016-04-27	Corrected garbled formatting in Setting up Oracle XE database

Revision history

Date	Description
2016-03-10	Truncated revision history to reduce bulk.
2016-03-08	Correct link to BlackBerry Dynamics Sizing Guide in Minimal Server Hardware Specifications .
2016-02-25	Added details about Microsoft Active Directory Support .
2016-02-09	Readded missing content for KCD, Direct Connect, and Server Clustering and Affinities that had been mistakenly removed. See Variations on deployment configurations .
2016-02-01	Included cross-reference to document describing Integrating BES12 and BlackBerry Dynamics .
2016-01-28	<ul style="list-style-type: none"> ▫ Do not use the \$ character in the SQL Server password more than once. See Setting up SQL Server database. ▫ Version numbers updated for latest release.
2015-12-23	Version numbers updated for latest release; no content changes.
2015-12-16	Added guidance on how to handle enterprise-CA-issued SSL certificates when adding new machines to a cluster in Installing additional Good Control server in server cluster
2015-12-15	<p>Added explanation to Variations on deployment configurations Variations on deployment configurations that this installation guide also includes the entire text of several other related guides:</p> <ul style="list-style-type: none"> ▫ <i>Direct Connect</i> ▫ <i>Kerberos Constrained Delegation</i> ▫ <i>Server Clustering and Affinities</i>
2015-12-10	Added note "About Importing Enterprise-CA-Issued SSL Certificates" in Installing the first Good Control server in server cluster : import enterprise certificates after installation.
2015-11-30	Microsoft Active Directory RODC not supported
2015-09-30	Backup your servers before attempting a complete re-installation, as discussed in Warning: backup before reinstall .

BlackBerry Dynamics server installation

This guide includes basic hardware and operating system software specifications, deployment topologies, and the installation steps for the Good Control server, its associated database, and the Good Proxy server.

Determining whether you should upgrade to BlackBerry UEM

If you require MDM or MAM capabilities, you must manage BlackBerry Dynamics apps using BlackBerry UEM. When you upgrade from Good Control to BlackBerry UEM, you not only get to use the great feature set that Good Control provides but you also get to take advantage of an enhanced feature set such as:

- ▮ Support for more policies for operating systems
- ▮ Better app management
- ▮ More container types
- ▮ Improved administration and provisioning
- ▮ Advanced connectivity and networking
- ▮ Expanded compliance and integrity checking
- ▮ Additional email, content, location, and certificate features
- ▮ Access to BlackBerry Web Services APIs

For information on how to use BlackBerry UEM to manage BlackBerry Dynamics apps, see the [Getting started with BlackBerry UEM and BlackBerry Dynamics content](#).

For more information on the benefits of using BlackBerry UEM, see [Benefits of upgrading from Good Control to BlackBerry UEM](#).

Required hardware and software for BlackBerry Dynamics

Planning materials are available, including details for supported versions of software, including databases, and recommended hardware configurations:

- ▮ [BlackBerry Secure Enterprise Planning Guide](#)
- ▮ [BlackBerry Secure Servers Compatibility Matrix](#)
- ▮ [BlackBerry Performance Calculator](#)

Warning: backup before reinstall

Important: Be sure to backup your servers before attempting a complete re-installation.

During deployment testing, if you decide you need to completely uninstall all your Good Control and associated servers and then reinstall them, you should back up your servers as described in the [BlackBerry Dynamics Server Backup and Restore](#) before you uninstall your servers.

Otherwise, on uninstall, you will lose all prior configuration, and you will have to reconfigure your deployment again from scratch.

With a backup, after you re-install, you can selectively restore portions of the configuration you had created previously.

About BlackBerry Dynamics software version numbers

The cover of this document shows the base or major version number of the product, but not the full, exact version number (which includes "point releases"), which can change over time while the major version number remains the same. The document, however, is always current with the latest release.

Product	Version
Good Control	4.1.57.49
Good Proxy	4.1.57.51
BlackBerry Dynamics Bindings for Xamarin.Android	3.2.0.3073
BlackBerry Dynamics Bindings for Xamarin.iOS	3.3.0.3259

If in doubt about the exact version number of a product, check the BlackBerry Developer Network for the latest release.

Variations on deployment configurations

BlackBerry Dynamics and its components are highly configurable to adapt to a wide variety of networking and security needs. This configurability can make planning a deployment appear more complex than it is. Here we present conceptual views of the basic deployment configurations to help you see more clearly the options available to you.

In many ways, the different deployment configurations are cumulative and complementary. There are many more possible configurations than are shown here. Here are six of the more common:

1. [Basic development configuration](#)
2. [Basic distributed servers](#)
3. [Distributed servers + web proxy](#)
4. [Distributed servers + web proxy + Direct Connect](#)
5. [Kerberos constrained delegation](#)

Important: The diagrams here are highly simplified, even oversimplified. For instance, the BlackBerry Network Operations Center (NOC) component is not pictured. Be sure to consult more detailed diagrams, network topologies, and other material from your BlackBerry technical representatives and in other BlackBerry Dynamics server-related separate guides and later sections in this document, including the following:

1. Basic development configuration

Probably the most common development environment or a proof-of-concept configuration has all the BlackBerry Dynamics components on a single machine.

BlackBerry Dynamics server installation

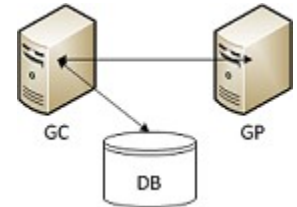


This configuration gives a developer of BlackBerry Dynamics-based applications the independent control to develop, deploy, and test an application without necessarily involving an IT administrator.

2. Basic distributed servers

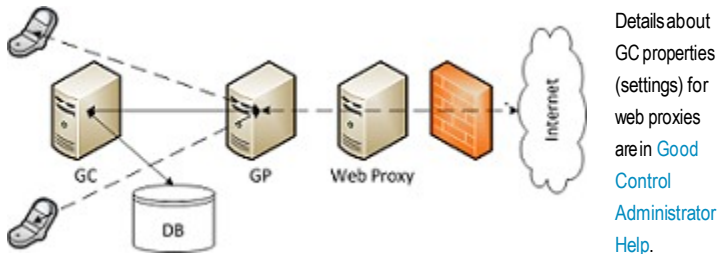
The simplest configuration of distributed servers is a dedicated machine (physical or virtual) for each BlackBerry Dynamics component.

This is the basic building block for all production deployments.



3. Distributed servers + web proxy

Another common deployment configuration of distributed servers includes a web proxy server for access from mobile devices to resources on the Internet that are external to the BlackBerry Dynamics deployment.

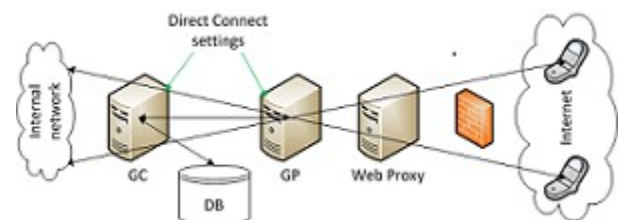


4. Distributed servers + web proxy + Direct Connect

Users of mobile devices in the field often need to access internal resources directly via the GP server, bypassing the BlackBerry Network Operations Center (NOC, not shown). This configuration is called *Direct Connect*.

Reasons for enabling Direct Connect include increased performance (by decreased network latency) and location sensitivity (such as avoiding sending traffic through U.S. or other data centers).

Detailed information about deploying Direct Connect is in the [BlackBerry Dynamics Direct Connect](#) guide and included later here..

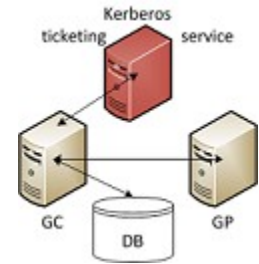


5. Kerberos constrained delegation

An alternative involves integration with the Kerberos Constrained Delegation (KCD) security system.

BlackBerry Dynamics server installation

Detailed information about deploying BlackBerry Dynamics with Kerberos is in [Kerberos Constrained Delegation](#), including properties in Good Control and more.



What's new?

What was new in release GC 2.1.xx.yy

Support for Microsoft SQL Server 2014

You can now run Good Control with Microsoft SQL Server 2014, in addition to the other supported databases.

The following specific versions have been certified:

- Microsoft SQL Server 2014 (SP2) (KB3171021) - 12.0.5000.0 (X64)
- Microsoft SQL Server 2014 (SP1-CU7) (KB3162659) - 12.0.4459.0 (X64)

Good Proxy installer Displays Good Control SSL certificate to trust, including enterprise certs

For new installations (but not for upgrades), the installation program for Good Proxy displays the SSL/TLS certificate of Good Control for the administrator to trust.

This certificate in Good Control can be either Good Control's own certificate or a certificate issued by the enterprise's own Certificate Authority.

This enhancement is to avoid the formerly required extra step for an administrator to first re-add Good Control's original certificate before installing the GP and then re-apply their enterprise certificate after installation.

During upgrade, automatic backup of Good Control files and SQL Server DB

During upgrade the Good Control installation program makes automatic backups of key directories and the SQL Server database, as shown below.

What	Location of Backup File	Name of Backup File
<i>Good_Control_installation_dir</i>	<i>Good_Control_installation_dir\backups\latest_timestamped_dir</i>	GoodControl.zip
C:\good	<i>Good_Control_installation_dir\backups\latest_timestamped_dir</i>	good.zip

The SQL Server database is backed up to the database server itself.

For details on how to restore the automatic backups, see [Restoring Good Control from Automatic Backup](#).

Good Control is now 64-bit

The Java Runtime Engine (JRE) installed with Good Control now runs in 64-bit mode (as opposed to 32-bit formerly).

The maximum amount of memory available to Good Control can thus be increased. For larger deployments, you should consider increasing the JRE's heap size beyond the default.

Important: To take advantage of the 64-bit JRE with Good Control, you must be running the 64-bit Windows operating system, if you are not already running it. Microsoft does not provide an easy path to upgrade the word size. So you need to install the Windows 64-bit OS first and then install the latest Good Control. Do a full backup of your current 32-bit GC installation as a safety measure.

Optional notification configuration for performance increase with Oracle

In addition to the database grants list above, in you are using Oracle, you might want to issue the following. This allows Good Control to receive notifications about changes to the database, instead of having to poll for such changes. The variable *username* is the name of the GC database owner; you must substitute your real name:

```
grant change notification to username;
```

BlackBerry Dynamics server/network specifications and deployment configurations

At its most basic, the BlackBerry Dynamics installation includes a database, the Good Control (GC) server and the Good Proxy (GP) server, which can all be installed on a single machine. This is the most basic deployment configuration and is suitable for proof-of-concept or demonstration but is not suitable for production use. For an overview of the common deployment configurations, see [Variations on deployment configurations](#).

The following are the minimum requirements to successfully install the BlackBerry Dynamics platform servers. These requirements apply to both physical and virtual machines:

- ▮ A host machine must be set up for the GC and GP servers. These servers can be installed on a single host machine or on separate machines. Other deployment variations are discussed in [Variations on deployment configurations](#)
- ▮ It is highly recommended that the database reside on a separate machine from the BlackBerry Dynamics servers if you are setting up a production installation. However, you can install all components on the same machine if you are setting up a development environment. See other deployment variations in [Variations on deployment configurations](#).
- ▮ Persons who handle the installation, maintenance, upgrade, and uninstallation of the BlackBerry Dynamics servers must have Microsoft Windows administrative privileges on all necessary machines.
- ▮ A service account or administrator account must be set up for the GC and GP servers to run as. This account must have Microsoft Windows administrative privileges on the target machine and the “Log on as a service” privilege. For more information or step-by-step instructions on how to grant this privilege, see <http://technet.microsoft.com> and search for “Log on as a service”.
- ▮ Ensure that the Display Name field in your Active Directory service is not null for all users who will log into the GC. Without a Display Name from AD, a user cannot login to GC and receives the message: Display Name Cannot be Null.

Microsoft Active Directory RODC not supported

"Read Only Domain Controllers" (RODC) are a feature of Microsoft's Active Directory software.

RODC AD servers are not supported by BlackBerry Dynamics. BlackBerry Dynamics supports only writable domain controllers.

Software restrictions

Do not install Apache or Tomcat software on the host machine prior to the installation of the GC/GP software.

You must disable any web servers or services, such as Microsoft IIS, that use ports 80 or 443.

Synchronized time among load balancers, GC, and GP

Ensure that the GC and GP servers' and load balancers' time/date are set correctly and are in synch. In an environment when the GP is not joined to the same time source (typically the same AD domain), it is especially important to ensure

the GP and GC times are in synch; otherwise the installation can fail at the certificate exchange phase. Consider using the Network Time Protocol (NTP).

Network requirements

This section describes a standard network integration of the GC and GP servers behind the enterprise firewall.

Intranet port configurations

Each BlackBerry Dynamics platform component uses different ports, so you must configure the host machine for each component accordingly. Make sure the following ports are open and available, and ensure that these ports are not in use by other servers or processes.

- The GC server host needs open inbound ports 443 and 17317. Port 443 is required for administrators and users to log into the GC console. The GP and GW installers connect to a GC server over port 443 during the server setup process. GP servers connect to GC servers on port 17317 during policy updates.
- The GP server host needs open inbound ports 17080 and 17433. Additionally, it should have at least 30,000 ports in the dynamic TCP port allocation, which are needed for outbound connections to the BlackBerry Dynamics NOC. (When Direct Connect is configured, however, these ports become inbound.)
- The database host machine needs open inbound port 1521 open for Oracle or port 1433 open for SQL Server.

SSL ciphers between GC and GP servers for Direct Connect

By default, SSL communications between the GC and GP servers over port 443 for the Direct Connect configuration uses the following ciphers:

- TLS_RSA_WITH_AES_256_CBC_SHA256 OR
- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384

One reason you might need to add more ciphers is if you have your own proxy server between your client devices and the GP server configured for Direct Connect. This middle proxy is the one that determines which SSL ciphers to use. You need to ensure that the GP server ciphers correspond to those required by your own proxy.

If you need to add more ciphers, after installation, edit the GP server's configuration file `c:\good\gps.properties` and add the names of the ciphers to the `gps.directconnect.supported.ciphers` key. See [List of supported SSL ciphers between GC and GP servers for Direct Connect](#).

[List of supported SSL ciphers between GC and GP servers for Direct Connect](#)

The complete list of supported ciphers is below. These are valid values for the GP server's property file `c:\good\gps.properties` and the `gps.directconnect.supported.ciphers` key.

SSL_DHE_DSS_EXPORT_WITH_DES40_CBC_SHA SSL_DHE_DSS_WITH_3DES_EDE_CBC_SHA

SSL_DHE_DSS_WITH_DES_CBC_SHA

SSL_DHE_RSA_EXPORT_WITH_DES40_CBC_SHA

BlackBerry Dynamics server/network specifications and deployment configurations

SSL_DHE_RSA_WITH_3DES_EDE_CBC_SHA
SSL_DHE_RSA_WITH_DES_CBC_SHA
SSL_DH_anon_EXPORT_WITH_DES40_CBC_SHA
SSL_DH_anon_EXPORT_WITH_RC4_40_MD5
SSL_DH_anon_WITH_3DES_EDE_CBC_SHA
SSL_DH_anon_WITH_DES_CBC_SHA
SSL_DH_anon_WITH_RC4_128_MD5
SSL_RSA_EXPORT_WITH_DES40_CBC_SHA
SSL_RSA_EXPORT_WITH_RC4_40_MD5
SSL_RSA_WITH_3DES_EDE_CBC_SHA
SSL_RSA_WITH_DES_CBC_SHA
SSL_RSA_WITH_NULL_MD5
SSL_RSA_WITH_NULL_SHA
SSL_RSA_WITH_RC4_128_MD5
SSL_RSA_WITH_RC4_128_SHA
TLS_DHE_DSS_WITH_AES_128_CBC_SHA
TLS_DHE_DSS_WITH_AES_128_CBC_SHA256
TLS_DHE_DSS_WITH_AES_256_CBC_SHA
TLS_DHE_DSS_WITH_AES_256_CBC_SHA256
TLS_DHE_RSA_WITH_AES_128_CBC_SHA
TLS_DHE_RSA_WITH_AES_128_CBC_SHA256
TLS_DHE_RSA_WITH_AES_256_CBC_SHA
TLS_DHE_RSA_WITH_AES_256_CBC_SHA256
TLS_DH_anon_WITH_AES_128_CBC_SHA
TLS_DH_anon_WITH_AES_128_CBC_SHA256
TLS_DH_anon_WITH_AES_256_CBC_SHA
TLS_DH_anon_WITH_AES_256_CBC_SHA256
TLS_ECDHE_ECDSA_WITH_3DES_EDE_CBC_SHA
TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA
TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256
TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA
TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384

BlackBerry Dynamics server/network specifications and deployment configurations

TLS_ECDHE_ECDSA_WITH_NULL_SHA
TLS_ECDHE_ECDSA_WITH_RC4_128_SHA
TLS_ECDHE_RSA_WITH_3DES_EDE_CBC_SHA
TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384
TLS_ECDHE_RSA_WITH_NULL_SHA
TLS_ECDHE_RSA_WITH_RC4_128_SHA
TLS_ECDH_ECDSA_WITH_3DES_EDE_CBC_SHA
TLS_ECDH_ECDSA_WITH_AES_128_CBC_SHA
TLS_ECDH_ECDSA_WITH_AES_128_CBC_SHA256
TLS_ECDH_ECDSA_WITH_AES_256_CBC_SHA
TLS_ECDH_ECDSA_WITH_AES_256_CBC_SHA384
TLS_ECDH_ECDSA_WITH_NULL_SHA
TLS_ECDH_ECDSA_WITH_RC4_128_SHA
TLS_ECDH_RSA_WITH_3DES_EDE_CBC_SHA
TLS_ECDH_RSA_WITH_AES_128_CBC_SHA
TLS_ECDH_RSA_WITH_AES_128_CBC_SHA256
TLS_ECDH_RSA_WITH_AES_256_CBC_SHA
TLS_ECDH_RSA_WITH_AES_256_CBC_SHA384
TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 = Default
TLS_ECDH_RSA_WITH_NULL_SHA
TLS_ECDH_RSA_WITH_RC4_128_SHA
TLS_ECDH_anon_WITH_3DES_EDE_CBC_SHA
TLS_ECDH_anon_WITH_AES_128_CBC_SHA
TLS_ECDH_anon_WITH_AES_256_CBC_SHA
TLS_ECDH_anon_WITH_NULL_SHA
TLS_ECDH_anon_WITH_RC4_128_SHA
TLS_EMPTY_RENEGOTIATION_INFO_SCSV
TLS_KRB5_EXPORT_WITH_DES_CBC_40_MD5
TLS_KRB5_EXPORT_WITH_DES_CBC_40_SHA

TLS_KRB5_EXPORT_WITH_RC4_40_MD5
TLS_KRB5_EXPORT_WITH_RC4_40_SHA
TLS_KRB5_WITH_3DES_EDE_CBC_MD5
TLS_KRB5_WITH_3DES_EDE_CBC_SHA
TLS_KRB5_WITH_DES_CBC_MD5
TLS_KRB5_WITH_DES_CBC_SHA
TLS_KRB5_WITH_RC4_128_MD5
TLS_KRB5_WITH_RC4_128_SHA
TLS_RSA_WITH_AES_128_CBC_SHA
TLS_RSA_WITH_AES_128_CBC_SHA256
TLS_RSA_WITH_AES_256_CBC_SHA
TLS_RSA_WITH_AES_256_CBC_SHA256 = Default
TLS_RSA_WITH_NULL_SHA256

Opening and checking outbound firewall configurations

If you limit outbound requests through your enterprise firewall, you need to permit access to the following IP ranges in order for the GC and GP servers to connect to the BlackBerry Dynamics Network Operations Center (NOC):

- | 206.124.114.1 through 206.124.114.254 (206.124.114.0/24) on port 443
- | 206.124.121.1 through 206.124.121.254 (206.124.121.0/24) on port 443
- | 206.124.122.1 through 206.124.122.254 (206.124.122.0/24) on port 443

You may alternatively wish to permit access to the specific network host names:

- | gdentgw.good.com on port 443
- | gdrelay.good.com on port 443
- | gdweb.good.com on port 443
- | gdmmdc.good.com on port 443
- | bxnroll.good.com on port 443
- | bxcheckin.good.com on port 443

If you make connections through a web proxy server, please make sure to enter the proxy information in both the GC and GP installers when asked to do so.

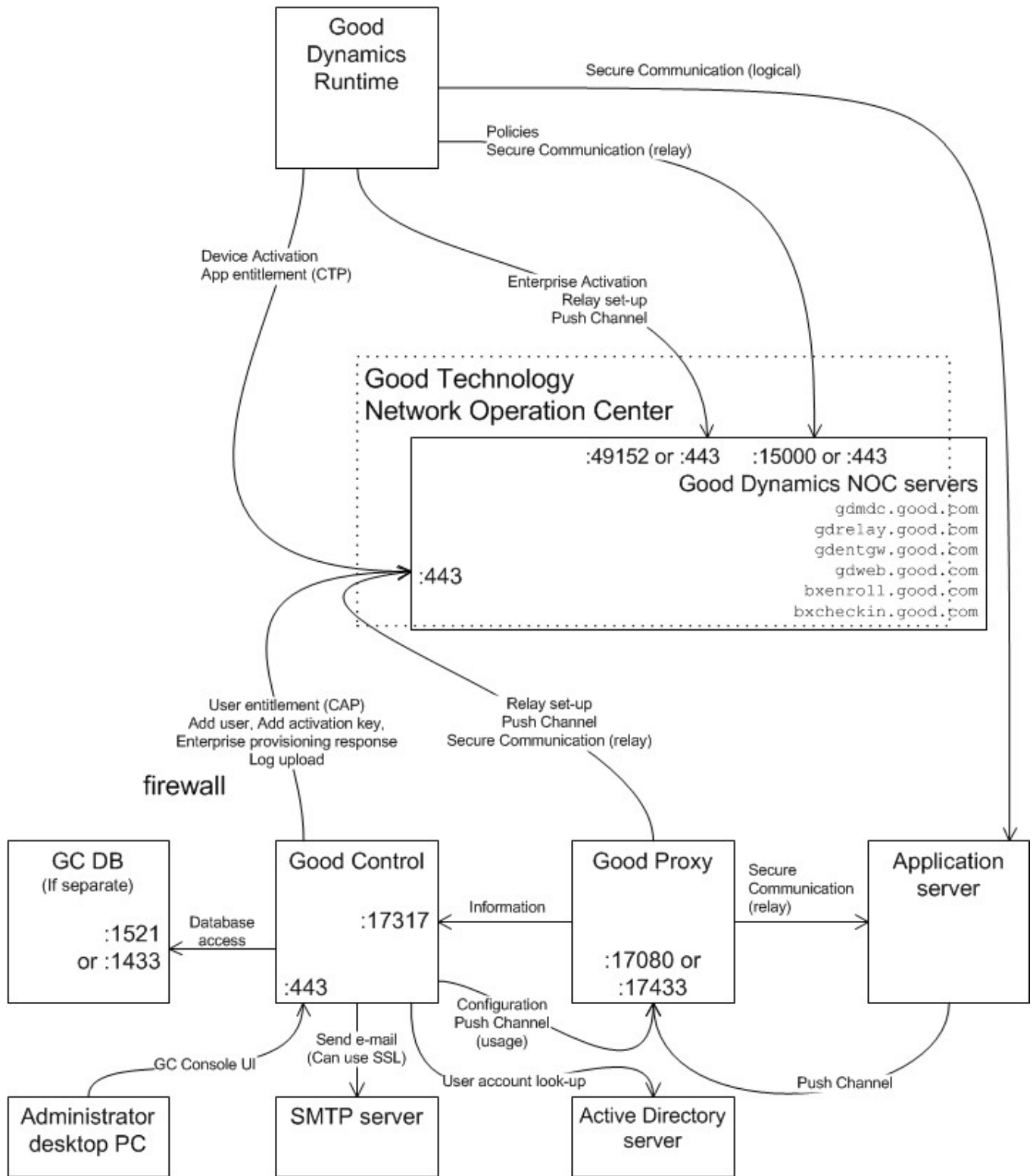
Note that no inbound ports through the enterprise firewall are required for the BlackBerry Dynamics platform.

The following diagram details the ports and connections between the components of the BlackBerry Dynamics platform. Keep the following in mind as you read the diagram:

BlackBerry Dynamics server/network specifications and deployment configurations

- All connections are TCP, not UDP.
- Arrows originate at the point from which communications are established. The direction of the arrows neither reflects the flow of data nor the end which initiates commands.
- The selection of high or low port numbers for clients connecting to BlackBerry NOC servers is configurable for each enterprise.
- “Secure Communication” refers to data that is sent by using the BlackBerry Dynamics Socket and BlackBerry Dynamics HTTP Request APIs.

BlackBerry Dynamics server/network specifications and deployment configurations



Server and port diagram

Installing the BlackBerry Dynamics servers and database

[microsoft port query tool](#)

You might want to verify the outbound connections with a network tool like [Microsoft PortQry](#) command-line tool or other networking utility to be sure that your firewalls are configured properly.

Latency between GC and database: maximum 10 ms

Make sure that the latency on the network connecting the Good Control server and its associated database is no greater than 10 milliseconds.

Email server configuration requirements

The BlackBerry Dynamics platform depends on the proper configuration of other software, such as Microsoft Exchange, which is not subject to the direct control of the BlackBerry Dynamics installation software.

If you are using Exchange, configure your server to include a dedicated receive connector for the GC server's IP address.

Browser recommendations for GC console

You use a web browser to access the GC console. The following versions of these browsers are fully compatible with the console.

Note: Other versions or browsers have not been certified.

- Mozilla Firefox 47
- Google Chrome 51.0.2704.84
- Microsoft Internet Explorer 11.0.9600.18349
- Apple Safari 9.1

Installing the BlackBerry Dynamics servers and database

Log on to the [BlackBerry Developer Network \(GDN\)](#) portal. If you do not have an active account, click **Login** or **Register** to sign up.

The following topics explain how to download, install and configure the BlackBerry Dynamics server side components and how to find and download the BlackBerry Dynamics SDK:

- [Pre-installation Checklist](#)
- [Installing the First Good Control Server in Server Cluster](#)
- [Installing Additional Good Control Server in Server Cluster](#)
- [Installing Good Proxy Server](#)

For POC, install BlackBerry Enterprise Mobility Server on separate server

For proof-of-concept (POC), the BlackBerry Enterprise Mobility Server (BEMS) must be installed on a server separate from the server for POC of GC, GP, and database.

Allowable characters in fields in the installation program

Many of the values of the fields in the Good Control and Good Proxy installation programs are used to generate various components of the system, such as SSL/TLS certificates. For example, the value for company name is used for the common name field of the generated certificates. The supported characters, which are a subset of the ASCII character set, are as follows:

- Letters a through z, A through Z
- Numbers 0 through 9
- Asterisk (*), period (.), underscore (_) and hyphen (-)

Note: The company name (common name) must not start or end with a "-" or a "."

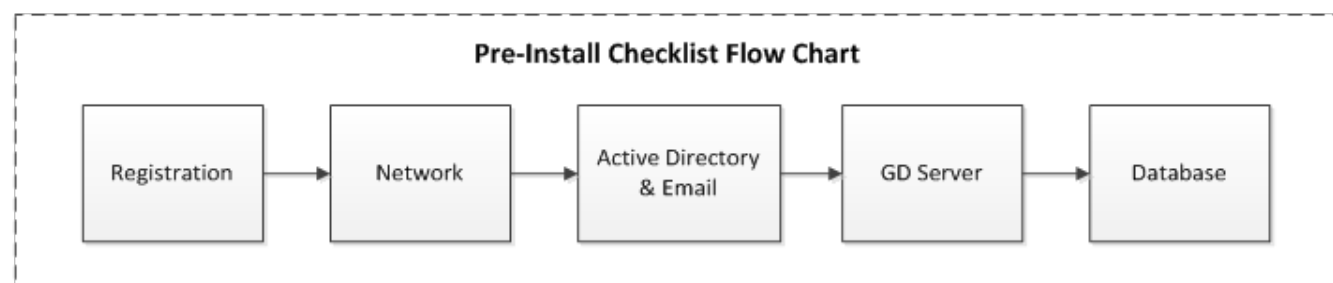
Upgrade or install GC and GP in parallel

Whenever a new version of Good Control is released, it is accompanied by a new version of Good Proxy. Likewise, a new release of Good Proxy always has a companion new release of Good Control. The two servers have mutual support for common features.

The installed versions of Good Control and Good Proxy must be kept in synch. You should always install the latest Good Proxy that accompanies the latest Good Control and vice versa.

Pre-installation checklist

It is highly recommended that the following checklist be completed before implementation takes place. This checklist is meant for a POC install of BlackBerry Dynamics.



Installing the BlackBerry Dynamics servers and database

Registration		Check
1.0	Read Determining whether you should upgrade to BlackBerry UEM and proceed only if you decide not to install BlackBerry UEM.	<input type="checkbox"/>
1.1	Register with the GDN Portal .	<input type="checkbox"/>
1.2	Download software from the GDN (Good Control & Good Proxy)	<input type="checkbox"/>
1.3	Create your Good Control license on the GDN .	<input type="checkbox"/>
1.4	Request your trial Apps .	<input type="checkbox"/>

Network, Server Hardware, Server Software		Check
2.1	<p>Double-check the following list against the canonical server port document at https://community.good.com/docs/DOC-1121</p> <p>Ensure that the BlackBerry Dynamics server has outbound (egress) access to the BlackBerry NOC on TCP port 443. The BlackBerry NOC has the following IP ranges:</p> <ul style="list-style-type: none"> 206.124.114.1 through 206.124.114.254 (206.124.114.0/24) on port 443 206.124.121.1 through 206.124.121.254 (206.124.121.0/24) on port 443 206.124.122.1 through 206.124.122.254 (206.124.122.0/24) on port 443 <p>You may alternatively wish to permit access to the specific network host names:</p> <ul style="list-style-type: none"> gdentgw.good.com on port 443 gdrelay.good.com on port 443 gdweb.good.com on port 443 gdmcd.good.com on port 443 bxnroll.good.com on port 443 bxcheckin.good.com on port 443 <p>You should probably verify that these ports are open with a network utility like Microsoft PortQry or Microsoft's version of traceroute.</p>	<input type="checkbox"/>
2.2	<p>If the BlackBerry server requires a Proxy server for external access. Please note the following:</p> <p>Proxy Server make/model:</p> <p>Authentication method:</p>	<input type="checkbox"/>
2.3	<p>Ensure that the BlackBerry Dynamics server has access to the database server if it is remote. The default port for MS SQL is TCP 1433.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note: The port must be static; GC does not support dynamic SQL port connections.</p> </div>	<input type="checkbox"/>
2.4	Make sure that the Domain Name System (DNS) has been properly setup on the BlackBerry	<input type="checkbox"/>

Installing the BlackBerry Dynamics servers and database

Network, Server Hardware, Server Software		Check
	<p>Dynamics servers themselves and that the DNS properly resolves the servers' fully qualified domain names (FQDNs):</p> <ul style="list-style-type: none"> ▫ You must use the fully qualified domain name for the server, like hostname.somedomain.com. Do <i>not</i> use just the bare hostname. ▫ The FQDN must be an A record in your DNS; that is, a canonical address record for this server. You must not use a DNS alias. 	
2.5	<p>Minimum server hardware for Proof-of-Concept (more is required for production) of Good Control, Good Proxy and database, not including BEMS, as follows:</p> <ul style="list-style-type: none"> ▫ Good Control: Pentium 2GHz dual core, 4GB RAM, 100GB disk ▫ Good Proxy: Pentium 2GHz dual core, 4GB RAM, 100GB disk ▫ Database: Pentium 2GHz dual core, 4GB RAM, 10GB disk <p>If you want to install servers (GC, GP, and database) on a single machine for POC, ensure the following:</p> <ul style="list-style-type: none"> ▫ Quad core / 2.4 GHz CPU or higher ▫ 16 GB RAM / 100 GB HDD ▫ 100/1000 Ethernet Card <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note: For POC, the BlackBerry Enterprise Mobility Server (BEMS) must be installed on a server separate from the server for POC of GC, GP, and database.</p> </div>	□
2.6	<p>The BlackBerry Dynamics servers require one of the following operating systems, real or virtualized:</p> <ul style="list-style-type: none"> ▫ Windows Server 2016 ▫ Windows Server 2012 or Windows 2012 R2 ▫ Windows Server 2008 or 2008 R2, 64-bit versions ▫ Windows 7 <p style="text-align: center;">Note: Although BlackBerry supports Windows 7 for development and testing, do not use Windows 7 as a production platform.</p>	□

Active Directory and Email		Check
3.0	Make sure your Microsoft Active Directory version is 2003, 2008, or 2012.	□
3.1	Create an AD service account for the BlackBerry Dynamics software, or if the GP is to be installed without AD, create a local MS Windows administrative service account.	□
3.2	The BlackBerry Dynamics server needs to send notification emails. Make sure SMTP relay is enabled for the BlackBerry Dynamics server on your email server.	□

Installing the BlackBerry Dynamics servers and database

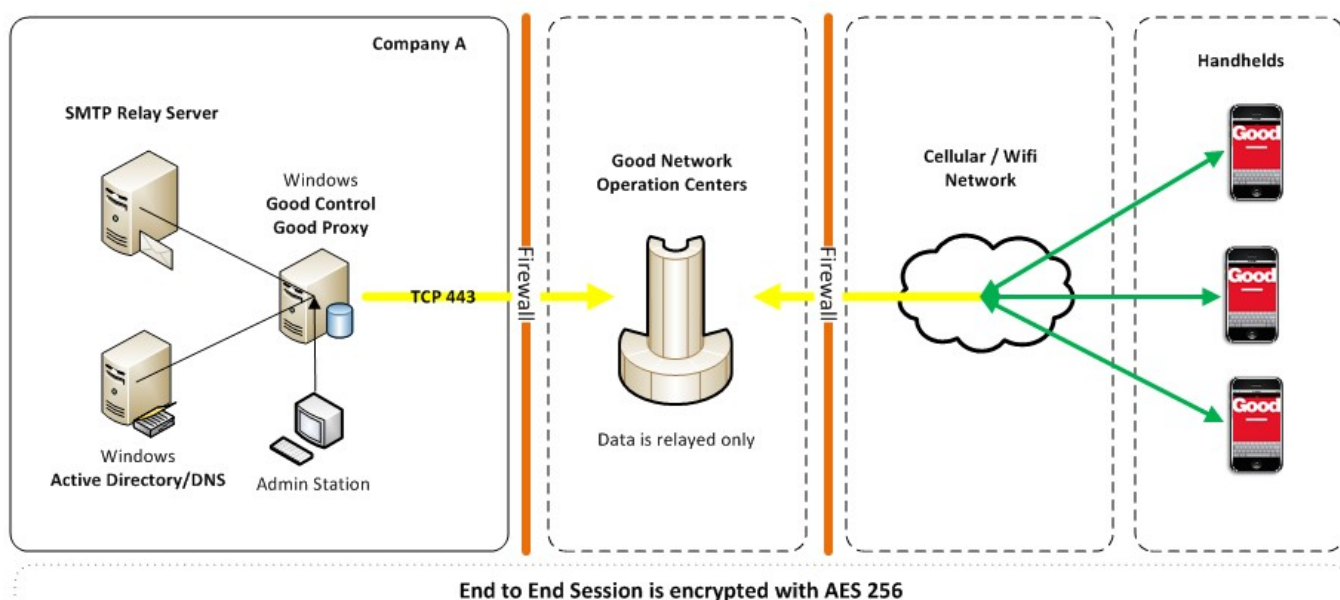
Good Dynamics Server: MS Windows System Administration		Check
4.1	Verify OS support. Windows Server 2008, 2008 R2 (32 or 64 bit) & 2012 is supported.	<input type="checkbox"/>
4.3	<p>Disable TCP auto tuning. Recommended if large file transfers are expected. "Run as Administrator" the following CMD command to disable TCP auto tuning:</p> <pre>netsh interface tcp set global autotuninglevel=disabled</pre> <p>A restart of the server is required for the setting to take effect.</p>	<input type="checkbox"/>
4.4	Ensure that the BlackBerry Dynamics Service account is a member of the local administrator group on the server	<input type="checkbox"/>
4.5	Ensure that the BlackBerry Dynamics Service account has "Logon As a Service" right	<input type="checkbox"/>
4.6	Ensure that the GC and GP servers' and load balancers' time/date are set correctly and are in synch. In an environment when the GP is not joined to the same time source (typically the same AD domain), it is especially important to ensure the GP and GC times are in synch; otherwise the installation can fail at the certificate exchange phase. Consider using the Network Time Protocol (NTP).	<input type="checkbox"/>
4.7	<p>Ensure that the server has been joined to the AD domain, unless you plan on installing the GC and GP servers in separate domains (the "GP as workgroup only" option).</p> <p>For GP as workgroup only, in the GP server's TCP/IP network setup, set the DNS suffix to local.</p>	<input type="checkbox"/>
4.8	Ensure that the Windows firewall is off	<input type="checkbox"/>
4.9	Ensure Antivirus/backup and backup software are stopped during the install	<input type="checkbox"/>
4.10	Ensure TCP port 80 and 443 are not already in use on the server.	<input type="checkbox"/>
4.11	Ensure that all BlackBerry Dynamics software is installed with the BlackBerry Dynamics service account.	<input type="checkbox"/>

Database		Check
5.1	<p>Verify Database server support. The following database servers are supported:</p> <ul style="list-style-type: none"> ▪ All editions of MSSQL Server 2012 ▪ All editions of MSSQL Server 2008 & 2008 R2 ▪ MSSQL Express 2008 R2 with Management Tools ▪ Enterprise or Standard edition of Oracle 10g/11g ▪ Express Edition of Oracle 10g/11g <p>For your convenience, here is the link to download MS SQL Express http://www.microsoft.com/en-us/download/details.aspx?id=23650.</p>	<input type="checkbox"/>

Installing the BlackBerry Dynamics servers and database

	Database	Check
5.2	Manually create a database for the BlackBerry Dynamics software on the database server. Default attributes are sufficient. The name of the database is arbitrary, but "GC" is recommended. This must be done prior to the install (very important!)	☐
5.3	Ensure that the BlackBerry Dynamics Service Account is the actual owner of the GC database - either the service account requires the db_owner right applied for the database, or the service account needs to be a SQL administrator account with the same right.	☐

Architecture diagram



Installing the Good Control database

As part of the database setup process, you need to create an account and set a password for the GC database user. If you do not have corporate security policies that govern the strength of account passwords, we recommend the following minimum requirements for password strength:

- At least 8 characters in length
- At least one numeric character
- At least one special character
- No character used more than twice

See the GC online help for instructions on how to change the database user password after installation is complete.

SQL Server database collation must be case-insensitive

The collation (sorting sequence) for the Microsoft SQL Server database for Good Control must be case-insensitive.

By default, SQL Server has case-insensitive collation, but if you have changed this default, set it back before installing.

Setting up Oracle XE database

The following instructions explain how to set up an Oracle XE 10g or 11g database user for GC.

1. Start the Run SQL Command Line program:
Start Menu > All Programs > Oracle Database Express Edition > Run SQL Command Line.

Enter **connect system**. When prompted, provide the **system** user's password.

2. Run the following command:

```
create user gc_db identified by password;  
grant connect to gc_db;  
grant resource to gc_db;  
alter user gc_db default role all;  
alter user gc_db default tablespace USERS;
```

This creates the **gc_db** user with a password of *password*. If you want to use a stronger password, replace *password* with a stronger value when you run this command. You can set any password for this user, but do keep in mind that you will need to enter the password value correctly when the GC installer asks for GC database information.

Optional caching configuration for performance increase

In addition to the database grants list above, you might want to issue the following. This allows Good Control to receive notifications about changes to the database, instead of having to poll for such changes:

```
grant change notification to $USER;
```

Setting up SQL Server database

SQL Server Management Studio is required for GC database setup; if your SQL Server installation does not include the SQL Server Management Studio software, it is available as a separate download from the Microsoft web site.

The following instructions explain how to set up a SQL Server database for GC:

1. Install the SQL Server database per the directions in the installation wizard. You can specify either "Windows Authentication mode" or "SQL Server and Windows Authentication mode" under the Security section of the Server Properties.
2. After installation, launch SQL Server Management Studio and log in. You will perform steps 3 and 4 through the SQL Server Management Studio console.
3. Set up the login that will be used to manage the GC database. Expand the Security item in the Object Explorer pane, then right-click **Logins** and select **New Login**.

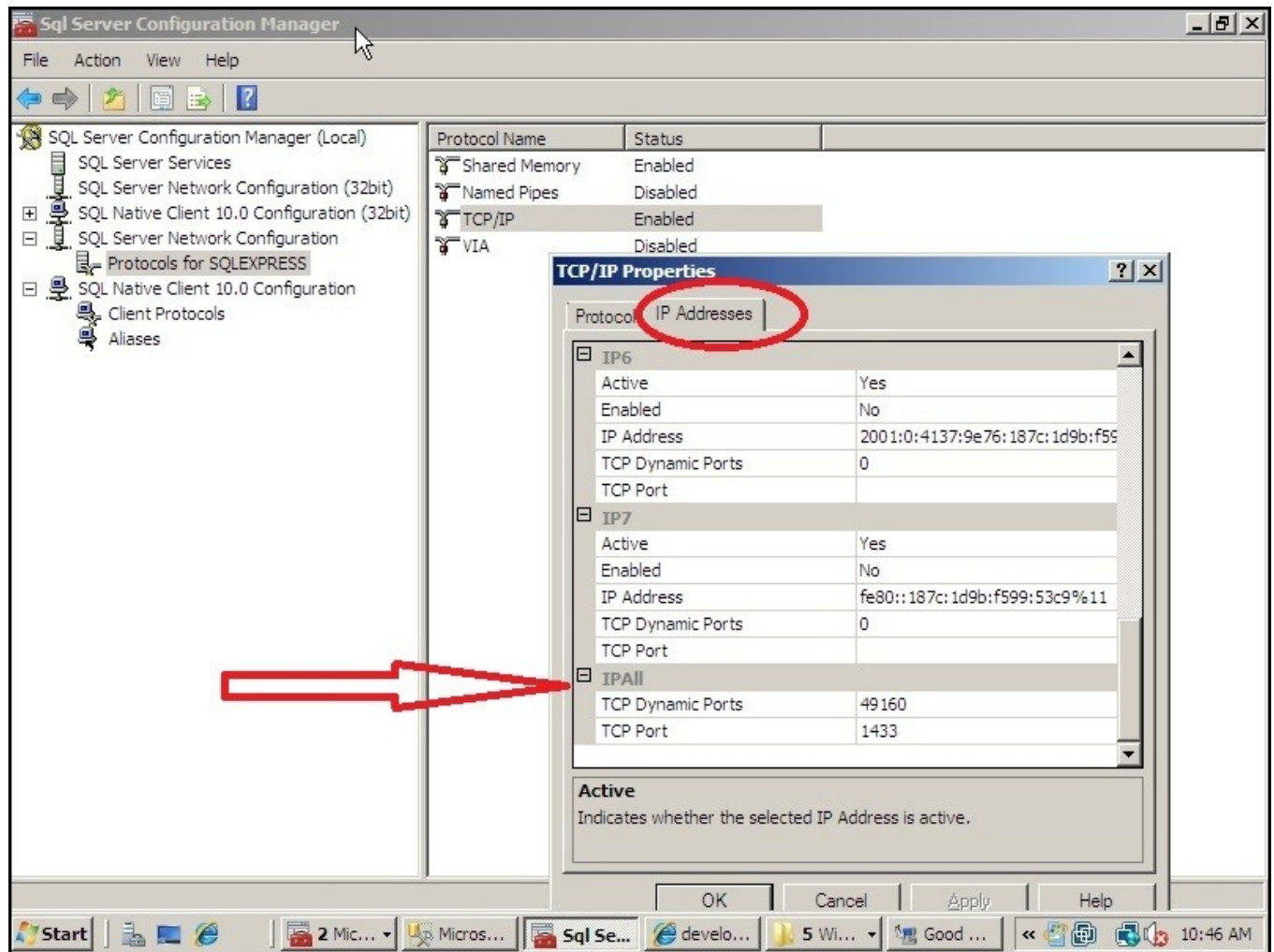
Installing the BlackBerry Dynamics servers and database

- a. If you selected “SQL Server and Windows Authentication mode” in the Server Properties and wish to have a SQL Server login to manage the GC database, enter `gc_db` as the Login name. Select **SQL Server authentication**.
- b. Set a password for this login. You will need to enter the password value correctly when the GC installer asks for GC database information.

Important: Do not use the \$ character in the password more than once.

- c. Click **OK** to add the login.
 - d. If you want to use a Windows account to manage the database, select “Windows authentication”. Enter the Windows account username in `domain\username` format as the Login name. This account should be the same as the service or administrator account set up to run the GC service. Click **OK** to add the login.
4. Right-click the **Databases** item in the Object Explorer pane, then select **New Database**. Enter `gc` as the Database name and set the login you configured in the previous step as the database Owner. Click **OK** to add the database.
 5. Launch the SQL Server Configuration Manager:
Start > All Programs > Microsoft SQL Server 2008 > Configuration Tools > SQL Server Configuration Manager.
 6. Select Protocols for SQLEXPRESS. Enable TCP/IP and add port 1433 for IPAll.

Installing the BlackBerry Dynamics servers and database



7. Restart the SQL Server service.

Optional: JDBC connection string for SQL mirroring

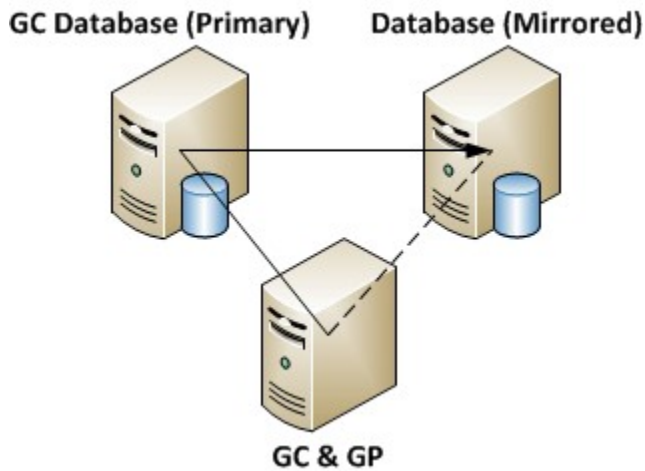
By default, Good Control is not configured for SQL mirroring, which is an optional deployment configuration. In a BlackBerry Dynamics deployment with SQL mirroring, when configured properly, Good Control automatically switches between the primary and mirrored DB when there is a failure on the primary DB. The SQL server used for mirroring (called the `failoverPartner`) must be configured in the Good Control JDBC (Java Data Base Connection) connection string. If the `failoverPartner` is not configured, Good Control cannot failover to the mirrored database.

Your database software must be configured for mirroring; GC controls only the connections to the database in case of failover, not the mirroring itself.

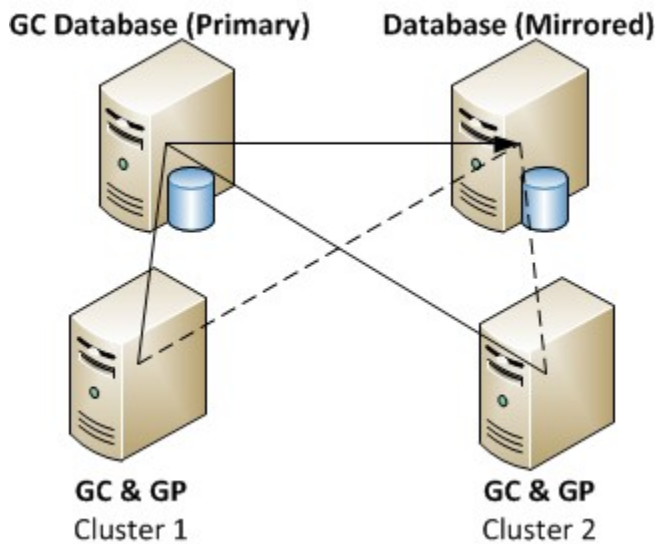
SQL mirroring is an active/passive technology; the primary DB is active and the mirrored DB is passive. Reading and writing to a mirrored DB is forbidden by SQL. As such, all Good Control servers must point to the principal SQL DB as the primary and the mirrored DB as the failover.

Here is a logical view of the GC connections to the database with SQL mirroring:

Installing the BlackBerry Dynamics servers and database



With clustered GCs, a logical view of the GC-to-database connections with SQL mirroring is as follows:



[Configuring the JDBC connection string for mirroring and failover](#)

Mirroring

To enable mirroring, you need to change the value of the `db.connection.url` key in the GC server's `C:\good\gc-server.properties` file to include the `failoverPartner` parameters (the details of the mirroring SQL server).

Here is an example of the default `db.connection.url` value:

```
db.connection.url=jdbc\:sqlserver\://  
server1  
\\MSSQLSERVER\1433;databaseName\=gc;selectMethod\=cursor;integratedSecurity\=true
```

Here is the changed value to include the `failoverPartner` parameters (the mirroring SQL server):

Installing the BlackBerry Dynamics servers and database

```
db.connection.url=jdbc\:sqlserver\:/  
server1  
\\MSSQLSERVER\1433;databaseName\=gc;  
failoverPartner\  
server2\\MSSQLSERVER\1433;selectMethod\=cursor;integratedSecurity\  
=true
```

Failover

For SQL AlwaysOn MultisubnetFailover we need to specify active SQL node (availability replica) as SQL server name during installation. See [Installing the first Good Control server in server cluster](#)

After the installation, specify the name of the availability group listener instead of availability replica in gc-server properties file and add additional parameter to DB connection URL - **multiSubnetFailover=True**

```
db.connection.url=jdbc\:sqlserver\://gdsq1aac01sql01.gd.sw.rim.net\1433;databaseName\=db5;sendStringParameters  
AsUnicode\  
=false;multiSubnetFailover\  
=True
```

Notes:

- The example strings above are all on a single line.
- Be sure to use the backslash \ to escape the special characters : \ and = as shown in the examples: \ : \\ and \\. For two backslashes, you need four: \\ \\.
- Be sure to substitute your own server names and configured port numbers for the *server1* and *server2* shown in the example.
- Update this value on all Good Control servers that are SQL-mirroring.
- Restart all Good Control servers for changes to take effect.

Migrating the Good Control database

Good Control supports databases from several different vendors. However, BlackBerry recommends that you migrate only among different database servers from the same vendor, such as Microsoft SQL Server to Microsoft SQL Server, not across vendors such as Microsoft SQL Server to Oracle. Migrating across different types of databases requires more extensive work than is discussed here.

Do not change the Good Control login authentication method

When you migrate from one database to another, do not change the authentication method used for logging in to Good Control. For instance, if the first database was set up to use SQL authentication for login, do not switch to use Windows authentication in the new database.

About migrating the database of a Good Control cluster

Important: If you are running a cluster of Good Control servers, you must:

- Shut down all GC servers in the cluster before migrating the database.
- Follow the procedures detailed here for all GC servers in the cluster.
- After finishing the procedures, restart all GC servers in the cluster.

Good Control's server properties file and database connections

The property file **C:\good\gc-servers.properties** includes database-related properties.

Important: You should make a backup copy of this file before you change the original.

After migrating your data, be sure to verify the following settings.

1. DB connection string. This is the value of **db.connection.url** property, as shown in the examples below.
2. DB user/owner. This is the value of the **db.connection.user** property, as shown in the examples below.

gc-servers.properties file with details for Oracle database

Note: In this example of **gc-servers.properties**, in the value of the **db.connection.url** property, the host name is **localhost: (HOST\=localhost)**. However, if your database is installed on a machine separate from your Good Control server, make sure you use the fully qualified domain name of your database server so your GC server can resolve the hostname of the database server.

Also make sure that the value of **SERVICE_NAME** (**GC**, in this example) matches what is required by your Oracle instance.

```
db.connection.url=jdbc\:oracle\:thin\:@ (DESCRIPTION\= (ADDRESS\= (PROTOCOL\=tcp) (HOST\=localhost)
(PORT\=1521)) (CONNECT_DATA\= (SERVICE_NAME\=GC)))
db.connection.user=gc_db
db.dialect=org.hibernate.dialect.Oracle10gDialect
db.driver=oracle.jdbc.driver.OracleDriver
gd.product.hostname=gc-server-123
gd.product.licensekey=5649-8E49-C9C7-C1D7-78EF-116B
gd.product.serialnum=GD1000001
```

gc-servers.properties file with details for Microsoft SQL Server database

Note: In this example of **gc-servers.properties**, in the value of the **db.connection.url** property, the host name is **localhost: sqlserver\://localhost**. However, if your database is installed on a machine separate from your Good Control server, make sure you use the fully qualified domain name of your database server so your GC server can resolve the hostname of the database server.

Also make sure that the value of **databaseName** (**gc**, in this example) matches name of your Oracle database.

```
db.-
con-
nection.url=jdbc\:sqlserver\://localhost\\SQLExpress\:1433;databaseName\=gc;selectMethod\=cursor

db.connection.user=gc_db
db.dialect=org.hibernate.dialect.SQLServerDialect
db.driver=com.microsoft.sqlserver.jdbc.SQLServerDriver
gd.product.hostname=gc-server-456
gd.product.licensekey=1A51-6D26-8469-6AEF-6361-7298
gd.product.serialnum=GD1000002
```

Changing the database password

Depending on how it was set up, your new database might have a different password than was set for the database you are migrating from.

BlackBerry supplies a script to update the password that Good Control needs to access the database. This script prompts you for the new database password, obfuscates the password, and then stores the obfuscated password for best security.

To change the database password:

1. On the Good Control server host machine, open a command window as administrator and enter the following command:

```
gc_install_dir\tools\password\changepwd.bat
```

2. You are prompted to select which password you want to change:
 - ┆ Enter: **GC_DB**
 - ┆ Enter the new password.
3. For changes to these properties to take effect, you need to restart the Good Control service. Go to the **Services** window.
4. Select the GC server from the list of services.
5. Click the **Start** command.

verification

BlackBerry recommends that with either SQL commands or Microsoft SQL Server management console, log in to the applicable database with the GC database user and password to verify that the account has full access.

Possible errors

If the above issues have not been addressed, the following errors might be recorded in the GC server logs when the GC is started.

```
┆ org.hibernate.exception.GenericJDBCException: Cannot open connection
  at
  org.hibernate.exception.SQLStateConverter.handledNonSpecificException
  (SQLStateConverter.java:140)
┆ java.sql.SQLException: Connections could not be acquired from the underlying
  database! at com.mchange.v2.sql.SqlUtils.toSQLException(SqlUtils.java:106)
┆ com.mchange.v2.resourcepoolCannotAcquireResourceException: A ResourcePool
  could not acquire a resource from its primary factory or source.
```

Installing the first Good Control server in server cluster

Here are the steps for installing Good Control on the first server in a cluster. The steps for remaining servers are described in [Installing additional Good Control server in server cluster](#).

Required: install or upgrade all servers in the cluster

You must install or upgrade all the servers in a cluster to the same version of Good Control before resuming operations. Servers in a cluster that are not upgraded will be in an inconsistent state which can cause problems in operation.

About importing enterprise-CA-issued SSL certificates

During installation, the GC and GP servers install an SSL certificate to secure communications and other needs. This certificate is issued by the BlackBerry Dynamics Certificate Authority (BlackBerry Dynamics CA) and is referred to as the "auto-installed" certificate.

Some enterprises might want to replace or supplement that auto-installed certificate with a certificate issued by their own enterprise certificate authority (CA).

Important: Do not attempt to import enterprise-CA-issued certificates during installation. Rely temporarily on the auto-installed certificate to install all GC server instances in the cluster.

After installation of all GC server instances in the cluster is complete, you can then proceed to import your own certificates. See [Installing SSL certificates on GC and GP servers](#) for steps.

Steps

To install the GC server, make sure you have the following:

- ▮ The GC installer (**gcsetup.exe**), which is available through the GDN portal.
- ▮ A License Key and Serial Number, which are available through the Licenses & Servers section on the GDN portal.
- ▮ Your Active Directory domain information.
- ▮ The fully qualified domain name (FQDN) of the GC server itself, which is a DNS A (or "address") record, not a DNS alias. For example, not just the bare **hostname** but **hostname.domain.com**.
- ▮ An administrator or service account set up on the host machine to run the GC service.
- ▮ Your SMTP server's connection information.
- ▮ Your database connection information.

This section provides information on the installation steps.

1. Run **gcsetup.exe** to begin the installation.
2. **Introduction** screen
3. **BlackBerry License Agreement** screen
4. **Third Party License Information** screen
5. **Host Information:** verify that the hostname and fully qualified Internet domain name (FQDN) displayed in the panel is correct for the target machine, like **gc.mydomain.com** (for example):
 - ▮ The hostname must not be an IP address.
 - ▮ The fully qualified domain name must be a DNS A record (canonical "address" record), not a DNS alias.

Installing the BlackBerry Dynamics servers and database

- | Only valid Internet domain names allowed, in conformance with RFC 1123 (<https://tools.ietf.org/html/rfc1123>).
- | No wildcard, control, or special characters allowed.
- | No underscores allowed.

Choose either to accept or to modify the values displayed by the installer.

6. **Choose Install Folder** screen: Accept the default, which is `C:\Program Files\BlackBerry\BlackBerry Control`, or specify the desired folder path.
7. **Choose Logs Folder** screen: make sure that the directory you specify is writable only by the service account installing the software. For security, the logs folder must not be writable by anyone else.

Note: If you are installing multiple GC or GP servers, such as in a cluster, each server must have a unique folder for logging. The servers must not share the same folder.

8. **Proxy Information** screen: the installer attempts to detect whether or not the host machine uses a proxy server to access the Internet. Follow the installer prompts as appropriate for your environment, and enter any additional requested information.
9. **Administrator Information** screen: enter the user name, domain, and password of the administrator account which will be used to run the GC server service.

The administrator must be a valid user in Active Directory. This user must be in the administrator group for the machine that will host the GC server and must have the “Log on as a service” privilege. This account is used to run the GC server as a Windows service and also serves as the first administrator login for the GC server.

By default, only users within the administrator account’s Active Directory domain can be given GC accounts; however, you can whitelist additional domains after the server is installed. See the Basic Server Settings section of the GC console’s built-in help for complete instructions.

10. **Database Information** screen: select the database type and enter the connection information.

Choose Oracle or SQL Server for the database type. Select the **Advanced** connection type to provide the full connection string or select the Basic connection type and provide the host (fully qualified Internet domain name or bare hostname as long as the GC server can connect), service and port for your database connection.

- | If you are using a database other than the default, you can also specify the database name, like this (for example): `mysql.mydomain.com\SQLEXPRESS`. Enter the GC database username and password that you created previously per the instruction in [Installing the Good Control database](#).
- | If you are using SQL AlwaysOn Multi-subnet Failover, enter the name of active SQL node (availability replica).

Important: After installation, edit the `gc-server properties` file and change the JDBC connection string to include the `MultiSubnetFailover=true` parameter as shown below. See the GC help for information about editing the `gc-server properties` file.

```
db.connection.url=jdbc:sqlserver://  
servername:1433;databaseName=db5;sendStringParametersAsUnicode=false;multiSubnetFailover=True
```

- | If you are using an Enterprise database for GC, contact your DBA for connection information.

Installing the BlackBerry Dynamics servers and database

11. **Domain Information** screen: check the “Use trusted domains” box if you need to add users to GC from additional domains.
12. **Mailbox Information** screen: select the option which describes how your Active Directory and email services are set up in your environment.
13. **Registration Information** screen: provide the license information for the new GC server.

Enter your company name and the Serial Number and License Key that you acquired from the BlackBerry Developer Network.

Note: Each license you generate on the BlackBerry Developer Network will allow you to deploy one GC server cluster. You enter this license on this screen, during the installation of the first GC server in the cluster. Once a license has been used to deploy a server cluster, it cannot be used to deploy additional server clusters.

12. **SMTP Information** screen: enter the SMTP server information.

In most cases, the SMTP server is your Microsoft Exchange server. GC uses the SMTP server to send welcome emails and provision emails to users. Users activate BlackBerry Dynamics applications on their devices using the access keys contained in provision emails, so it is important to make sure the SMTP connection information is correct.

13. **Pre-Installation Summary** screen: review the information and if everything is correct, click Install.
14. **Certificate Information prompt:** review the certificate generated by the installer.
15. **Install Complete** screen: click **Done** to quit the installer.
The installation logs are located in the C:\good\ialogs directory.
16. You can access the GC console by pointing your browser to <https://localhost/> or https://server_name on the GC server host machine.

The GC console login screen appears, and you can log in using the account credentials you supplied to the installer in step 8.

Also, browse to https://server_name from another machine on your enterprise network to verify that you can access the GC server. Make sure your firewall settings allow incoming connections from domain networks.

If the GC console does not load in your browser, check the status of the Good Control Windows service, and start the service if it is not already running. The GC server logs are located in the C:\good\gclogs directory.

Installing additional Good Control server in server cluster

To install the GC server, make sure you have the following:

- The GC installer (**gcsetup.exe**), which is available through the GDN portal
- A host machine that belongs to the same domain as the other GC servers in the cluster
- An administrator or service account, already added to the list of GC administrators, set up on the host machine to run the GC service
- Your SMTP server’s connection information

Installing the BlackBerry Dynamics servers and database

- Connection information for the database used by other GC servers in the cluster
- A GC server license which was generated through the console of a GC server that already resides in the cluster

Steps

1. Run **gcsetup.exe** to begin the installation.
2. **Introduction** screen
3. **BlackBerry License Agreement** screen
4. **Third Party License Information** screen
5. **Host Information**: verify that the hostname and fully qualified Internet domain name (FQDN) displayed in the panel is correct for the target machine, like **gc.mydomain.com** (for example):
 - The hostname must not be an IP address.
 - The fully qualified domain name must be a DNS A record (canonical "address" record), not a DNS alias.
 - Only valid Internet domain names allowed, in conformance with RFC 1123 (<https://tools.ietf.org/html/rfc1123>).
 - No wildcard, control, or special characters allowed.
 - No underscores allowed.

Choose either to accept or to modify the values displayed by the installer.

6. **Choose Install Folder** screen: Accept the default, which is **C:\Program Files\BlackBerry\BlackBerry Control**, or specify the desired folder path.
7. **Choose Logs Folder** screen: make sure that the directory you specify is writable only by the service account installing the software. For security, the logs folder must not be writable by anyone else.

Note: If you are installing multiple GC or GP servers, such as in a cluster, each server must have a unique folder for logging. The servers must not share the same folder.

8. **Proxy Information** screen: the installer attempts to detect whether or not the host machine uses a proxy server to access the Internet. Follow the installer prompts as appropriate for your environment, and enter any additional requested information.
9. **Administrator Information** screen: enter the user name, domain, and password of the administrator account which will be used to run the GC server service.

The administrator must be a valid user in Active Directory. This user must be in the administrator group for the machine that will host the GC server and must have the "Log on as a service" privilege. Also, the user must already be a GC administrator; if this condition is not met, you can log into the console of any GC in the cluster and add the user to the list of GC administrators on the **Roles > Administrators** screen.

10. **Database Information** screen; select the database type and enter the connection information.

You must enter the database connection information used by other GC servers in the cluster. Choose Oracle or SQL Server for the database type. Select the Advanced connection type to provide the full connection string or select the Basic connection type and provide the host, service and port for your database connection.

Installing the BlackBerry Dynamics servers and database

Confirm when the installer asks if you want to install the new GC in the existing server cluster.

11. **Registration Information** screen; provide the license information for the new GC server.

If you have not already obtained a license for your new GC server, log into the console of a GC server that already resides in the cluster and go to the **Server Configuration > Licenses** screen, then click Generate License. GC creates a new license and displays it on the console.

In the installer, enter your company name, if requested, and provide the license key that was generated by the GC console.

Note: Each license you generate through the GC console allows you to install one additional GC server in the cluster. Do not attempt to reuse a license that has already been consumed.

12. **SMTP Information** screen; enter the SMTP server information.

In most cases, the SMTP server is your Microsoft Exchange server. GC uses the SMTP server to send welcome emails and provision emails to users. Users activate BlackBerry Dynamics applications on their devices using the access keys contained in provision emails, so it is important to make sure the SMTP connection information is correct.

13. **Pre-Installation Summary** screen; review the information and if everything is correct, click **Install**.
14. **Certificate Information prompt**; review the generated certificate.
15. **Install Complete** screen; click **Done** to quit the installer.

The installation logs are located in the C:\good\ialogs directory.

14. You can access the GC interface by pointing your browser to <https://localhost/> or https://server_name on the GC server host machine.

The GC console login screen appears, and you can log in using the account credentials you supplied to the installer in step 8.

Also, browse to https://server_name from another machine on your enterprise network to verify that you can access the GC server. Make sure your firewall settings allow incoming connections from domain networks.

If the GC console does not load in your browser, check the status of the Good Control Windows service, and start the service if it is not already running. The GC server logs are located in the C:\good\gclogs directory.

Installing Good Proxy server

You must have the following in order to install the GP server:

- The GP server installer (**gpsetup.exe**), which is available through the GDN portal
- The GC server and GP server fully qualified domain names. Not just the bare **hostname**, but the full **hostname.somedomain.com**.

About enterprise-CA-issued SSL certificates from Good Control

If you want to use your own enterprise-CA-issued SSL certificate with the Good Proxy, be sure to install that certificate on your Good Control servers before installing Good Proxy. See [Installing SSL certificates on GC and GP servers](#) for steps.

Installing the certificate on Good Control saves you the time of installing the certificate on each Good Proxy server individually after installation of Good Proxy.

Installation steps

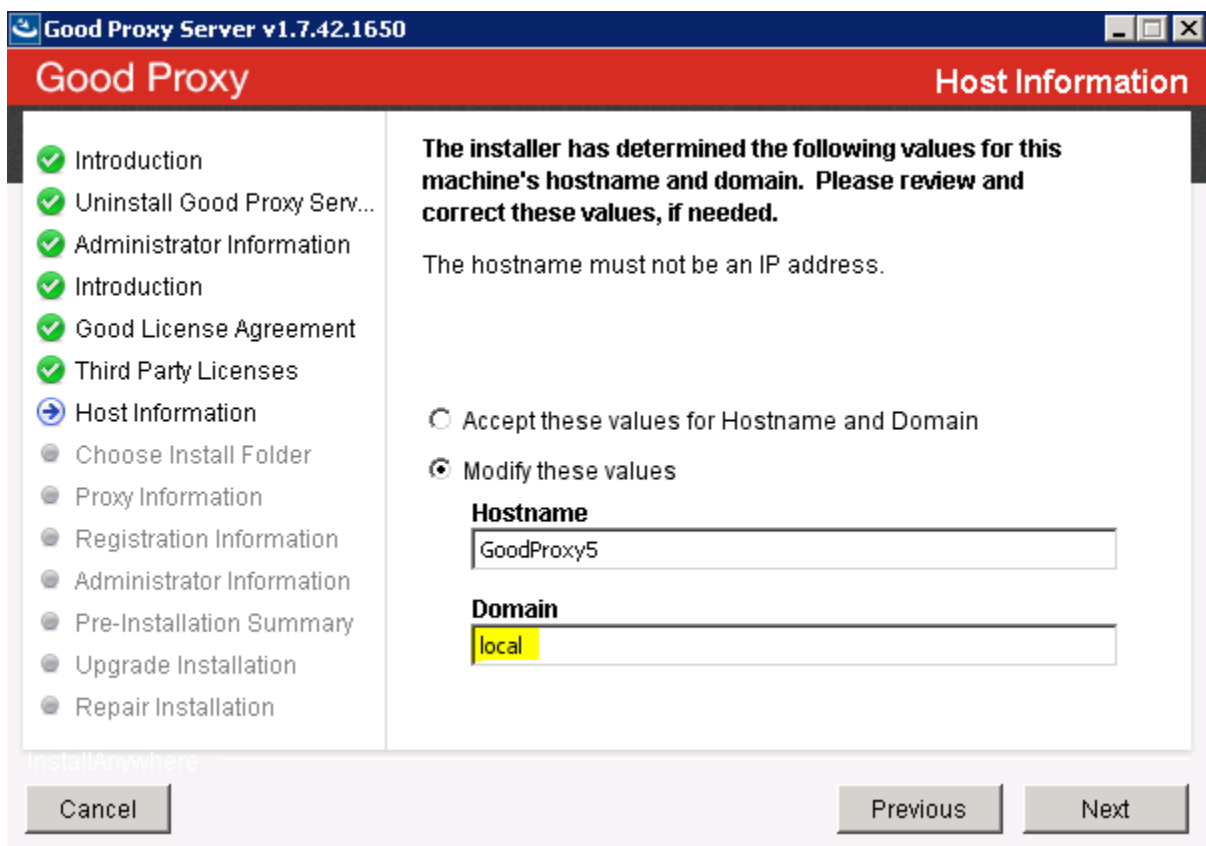
1. Run **gpsetup.exe** to begin the installation.
2. **Introduction** screen
3. Accept the **Third Party License Information**.
4. If your system has insufficient memory, you will see a warning to increase it.
5. **Choose destination folder**: you can change the drive designator but do not change the installation location. Accept the default.
6. Choose a folder for storing logs: Specify the desired folder or click Next to accept the default.
7. **Web proxy information**: If you are using a web proxy server to access the Internet, click **Use a Web Proxy** and then supply the necessary information appropriate for your environment. If your web proxy requires authentication, supply the necessary credentials.
8. For the **Registration Information**, unless you are installing "GP as workgroup only", accept the default value or enter the fully qualified domain name of the GC server, like gc.mydomain.com. Do not enter an IP address.

(missing or bad snippet)

The additional steps for GP as workgroup only at this point are detailed below.

Installing the BlackBerry Dynamics servers and database

- a. For the **Domain** field enter `local`, and continue.



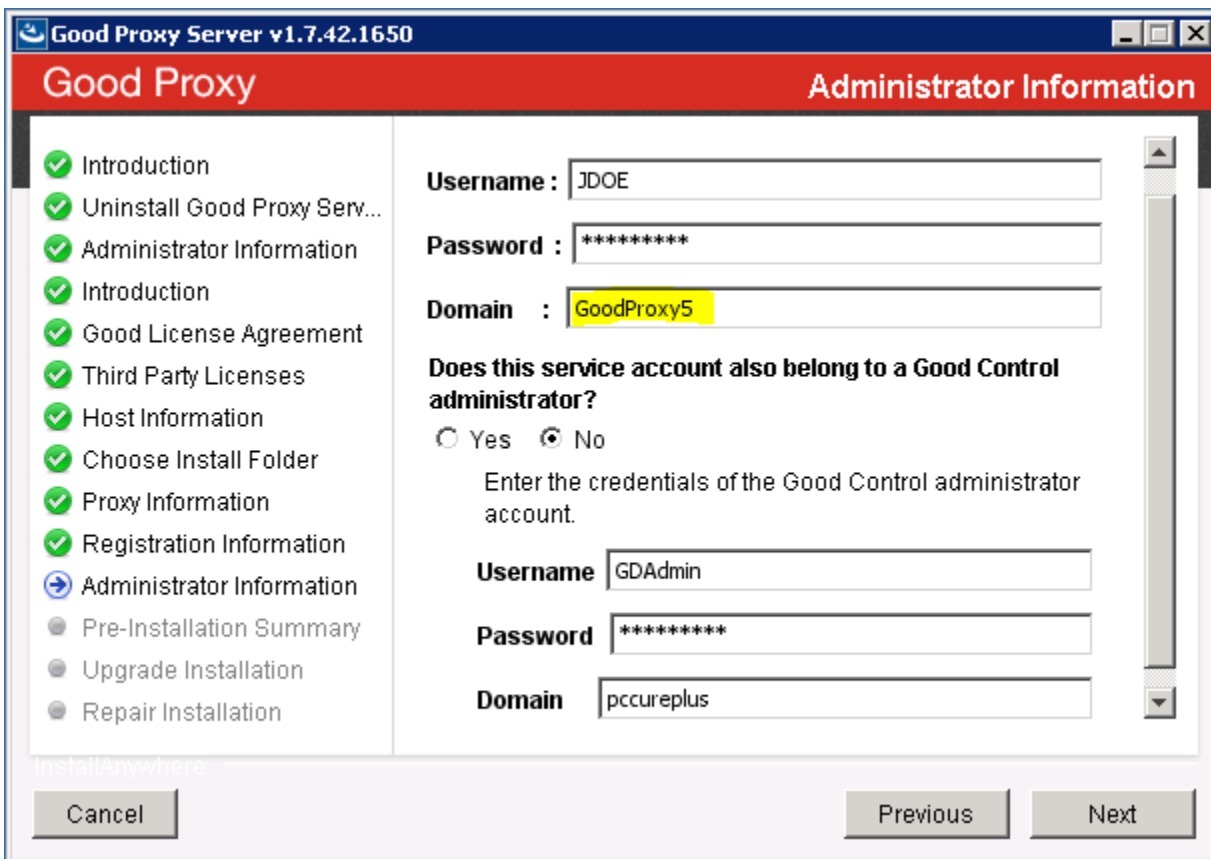
- b. Supply the details for the fields in the top section of **Administrator Information** (the next screen of the installer):

Field or Prompt	Details
Enter the Credentials for the Good Proxy service account	This is the <code>local</code> user on the Good Proxy server.
Good Proxy domain field	Must be the host name of the Good Proxy
Does this service account also belong to a Good Control Administrator?	Select No .

Installing the BlackBerry Dynamics servers and database

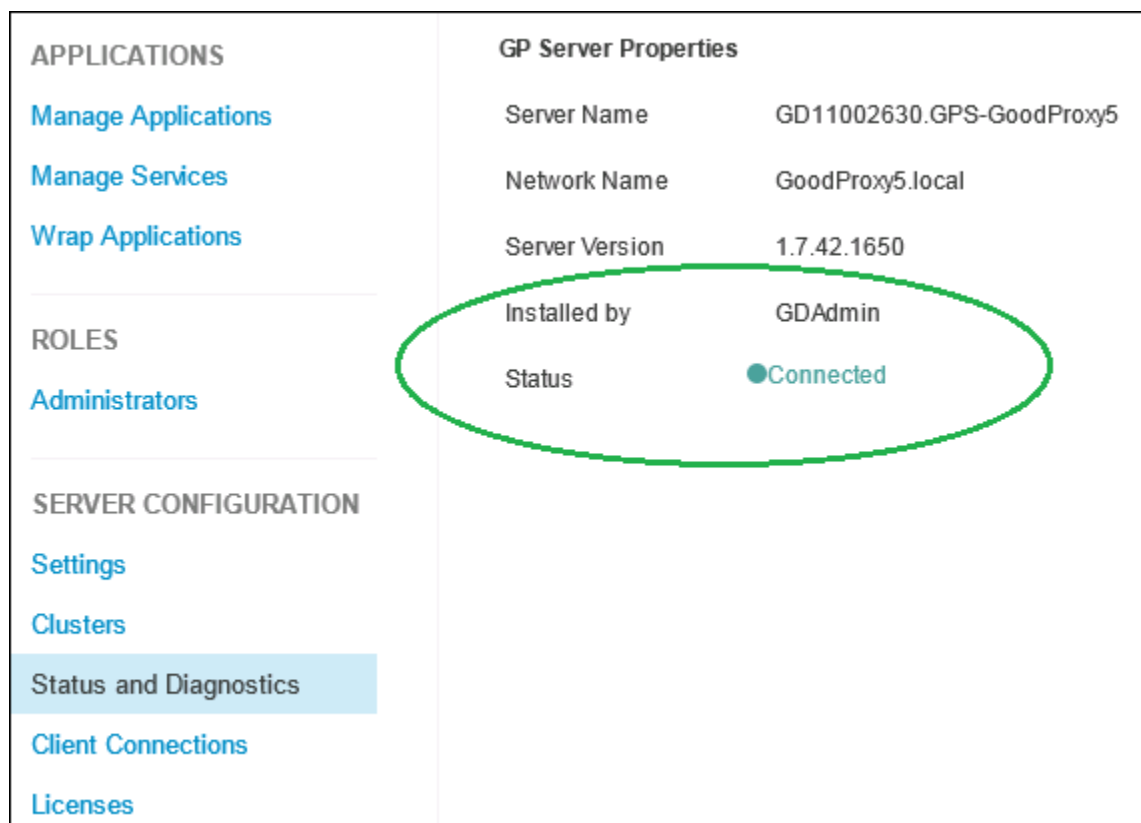
Field or Prompt	Details
Enter the credentials of the Good Control Administrator	Supply the correct values.

Below is an example of the fields and values:



- c. Complete the installation and confirm the Good Proxy shows connected in the Good Control **Console > Status and Diagnostics**, as shown below:

Installing the BlackBerry Dynamics servers and database



The screenshot displays the 'GP Server Properties' window. On the left, there is a navigation pane with sections: APPLICATIONS (Manage Applications, Manage Services, Wrap Applications), ROLES (Administrators), SERVER CONFIGURATION (Settings, Clusters, Status and Diagnostics, Client Connections, Licenses). The main area shows the following properties:

GP Server Properties	
Server Name	GD11002630.GPS-GoodProxy5
Network Name	GoodProxy5.local
Server Version	1.7.42.1650
Installed by	GAdmin
Status	● Connected

The 'Installed by' and 'Status' rows are circled in green in the original image.

- The SSL/TLS certificate to secure communications with the GC is presented to you for trusting. Click **Accept** to continue or **Reject**.
- Supply the following information on the **Administrator Information** screen.

Note: If you are installing GP as workgroup only, see the details in the previous step.

- Enter the username, password, and domain of the account to be used by the GP service.
- Depending on whether this service account also belongs to a Good Control administrator, check **Yes** or **No**. If **Yes**, enter the username, domain, and password of the account needed by GP to connect to that Good Control service.

Note: This user must be in the administrator group for the machine that hosts the GP service and must have the "Log on as a service" privilege. Also, the user must be a GC administrator. This account is used to run the GP server as a Windows service.

- Pre-Installation Summary:** verify the information and if everything is correct, click **Install**.
- Install Complete** screen: click **Done** to exit the installer.

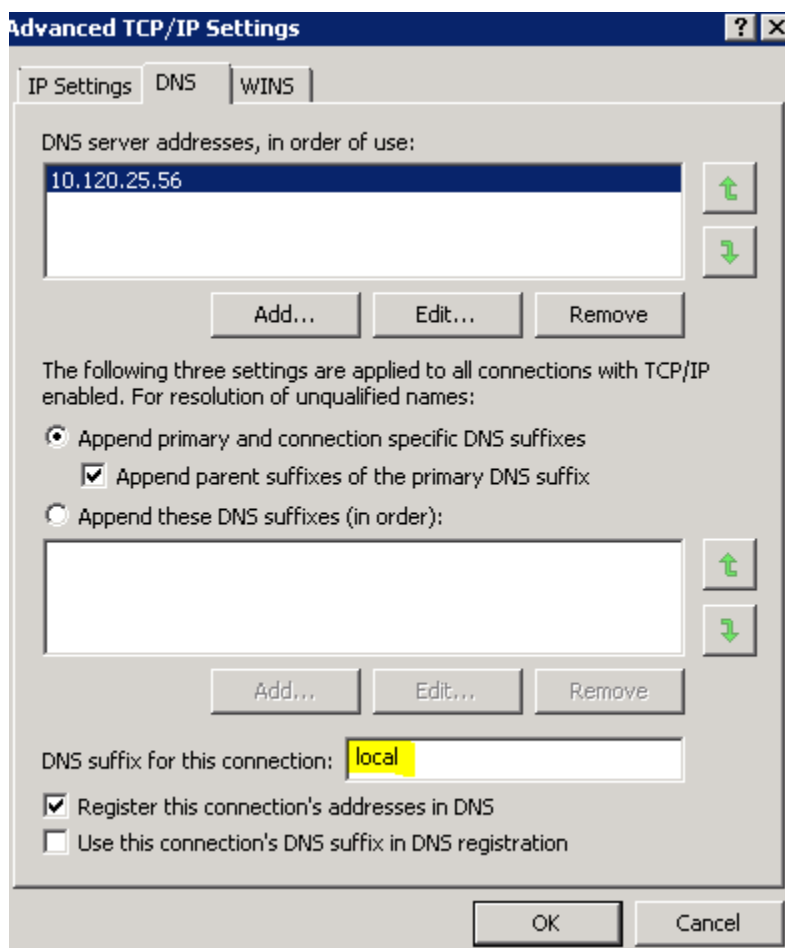
Network setup for GP as "workgroup only"

The default installation option is that the GP and the GC are in the same domain. Installing GP as "workgroup only" (that is, in a domain that is distinct from the domain of the GC server) is a deployment option for GP detailed in the step for **Registration Information**, below.

The installation for GP as workgroup only is essentially the same as the default, with some slight differences in settings.

If you are deploy GP as workgroup only, before beginning the actual GP installation, make sure of the following on MS Windows:

1. Grant "Log on as service" right to a local user account on the Good Proxy server's Local Security Policy.
2. In MS Windows Advanced TCP/IP settings, enter **local** for the DNS suffix.



Now follow the actual installation steps and see the rest of the configuration for GP as workgroup only under the **Registration Information** step below.

Installation steps

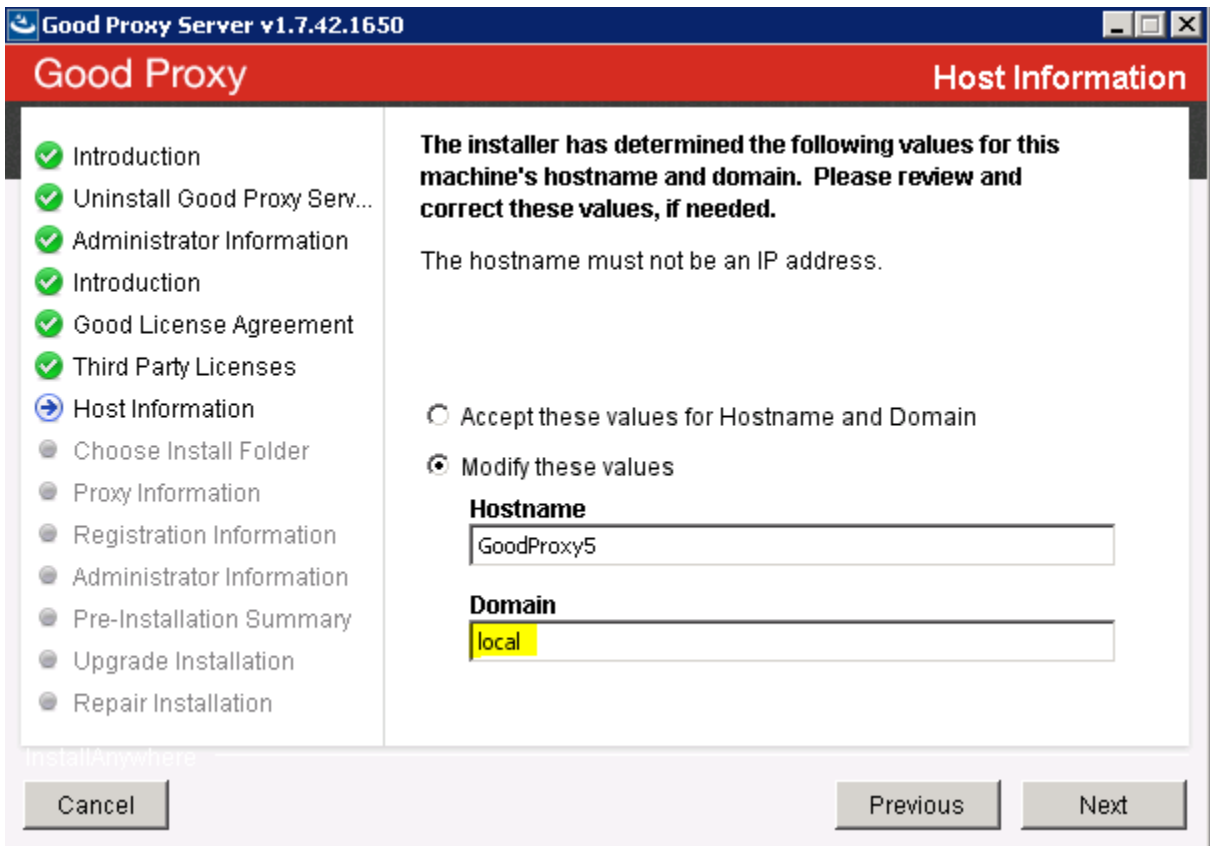
1. Run **gpsetup.exe** to begin the installation.
2. **Introduction** screen
3. Accept the **BlackBerry License Agreement**.
4. Accept the **Third Party License Information**.
5. **Host and domain information**: verify that the the hostname and fully qualified Internet domain name displayed in the panel is correct for the target machine, like mygc.mydomain.com (for example). The hostname must not be an IP address. Either accept the supplied values or modify the values provided by the installer.
6. **Choose destination folder**: you can change the drive designator but do not change the installation location. Accept the default.
7. **Web proxy information**: If you are using a web proxy server to access the Internet, click **Use a Web Proxy** and then supply the necessary information appropriate for your environment. If your web proxy requires authentication, supply the necessary credentials.
8. For the **Registration Information**, unless you are installing "GP as workgroup only", accept the default value or enter the fully qualified domain name of the GC server, like gc.mydomain.com. Do not enter an IP address.

(missing or bad snippet)

The additional steps for GP as workgroup only at this point are detailed below.

Installing the BlackBerry Dynamics servers and database

- a. For the **Domain** field enter `local`, and continue.



- b. Supply the details for the fields in the top section of **Administrator Information** (the next screen of the installer):

Field or Prompt	Details
Enter the Credentials for the Good Proxy service account	This is the <code>local</code> user on the Good Proxy server.
Good Proxy domain field	Must be the host name of the Good Proxy
Does this service account also belong to a Good Control Administrator?	Select No .

Installing the BlackBerry Dynamics servers and database

Field or Prompt	Details
Enter the credentials of the Good Control Administrator	Supply the correct values.

Below is an example of the fields and values:

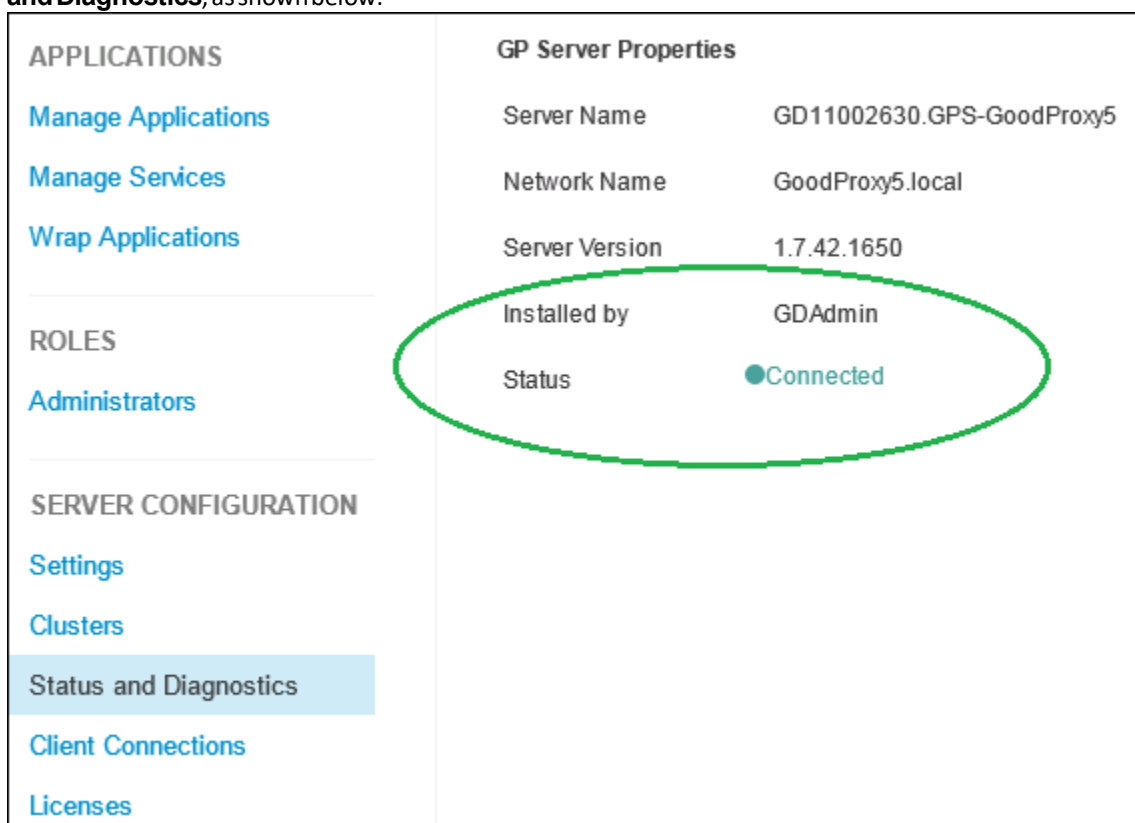
The screenshot shows the 'Administrator Information' dialog box for Good Proxy Server v1.7.42.1650. The window title is 'Good Proxy Server v1.7.42.1650' and the dialog title is 'Good Proxy Administrator Information'. On the left, a navigation pane lists various steps, with 'Administrator Information' selected. The main area contains the following fields and options:

- Username:** JDOE
- Password:** *****
- Domain:** GoodProxy5
- Does this service account also belong to a Good Control administrator?**
 - Yes
 - No
- Enter the credentials of the Good Control administrator account.
 - Username:** GAdmin
 - Password:** *****
 - Domain:** pccureplus

At the bottom, there are 'Cancel', 'Previous', and 'Next' buttons. The text 'InstallAnywhere' is visible in the bottom left corner.

Installing the BlackBerry Dynamics servers and database

- c. Complete the installation and confirm the Good Proxy shows connected in the Good Control **Console > Status and Diagnostics**, as shown below:



The screenshot displays the Good Control console interface. On the left, there are three main sections: APPLICATIONS, ROLES, and SERVER CONFIGURATION. The APPLICATIONS section includes links for Manage Applications, Manage Services, and Wrap Applications. The ROLES section includes Administrators. The SERVER CONFIGURATION section includes Settings, Clusters, Status and Diagnostics (which is highlighted), Client Connections, and Licenses. On the right, the GP Server Properties are listed: Server Name (GD11002630.GPS-GoodProxy5), Network Name (GoodProxy5.local), Server Version (1.7.42.1650), Installed by (GDAdmin), and Status (Connected). The Status field is circled in green.

GP Server Properties	
Server Name	GD11002630.GPS-GoodProxy5
Network Name	GoodProxy5.local
Server Version	1.7.42.1650
Installed by	GDAdmin
Status	● Connected

9. Supply the following information on the **Administrator Information** screen.

Note: If you are installing GP as workgroup only, see the details in the previous step.

- Enter the username, password, and domain of the account to be used by the GP service.
- Depending on whether this service account also belongs to a Good Control administrator, check **Yes** or **No**. If **Yes**, enter the username, domain, and password of the account needed by GP to connect to that Good Control service.

Note: This user must be in the administrator group for the machine that hosts the GP service and must have the “Log on as a service” privilege. Also, the user must be a GC administrator. This account is used to run the GP server as a Windows service.

- When asked to trust the certificate retrieved from the GC server, click **Accept** or **Reject**.
- Pre-Installation Summary:** verify the information and if everything is correct, click **Install**.
- Install Complete** screen: click **Done** to exit the installer.
- The installation logs are located in the C:\good\ialogs directory, and the GP server logs are located in the C:\good\gpslogs directory.

Additional Windows configuration: autotuning

Starting with Windows Vista, Microsoft introduced the Receive Window Auto-Tuning feature which continually monitors network conditions and scales the TCP Receiving Window for optimal performance. Unfortunately, older routers and firewalls may not handle the window scaling correctly and may cause data loss or dropped connections.

We highly recommend that you perform the following steps to avoid this issue if your GP server is installed on a machine running a more recent Windows OS than Vista.

1. Launch a command prompt as an administrator.
2. You must open a 64-bit command prompt if you are running a 64-bit version of Windows. For 32-bit and 64-bit Windows installations, navigate to your Windows System32 directory (usually in C:/Windows/System32), right click the cmd.exe file, and select the **Run as administrator** option.
3. Run the following command:
netsh interface tcp set global autotuninglevel=disabled
4. Restart the machine.

Increasing number of sockets on MS Windows

Important: For GP servers on Microsoft Windows, you must increase the range of sockets (called "dynamic port range for TCP"). BlackBerry recommends that you allocate at least 50,000 ports. The default range allows only 16,384 dynamic ports, which is not sufficient for the Good Proxy, which requires two ports for each connection (one to the device and one to the application server). Without this setting, connections might be blocked when the GP runs out of available sockets.

For specific commands to configure Microsoft Windows, see the Microsoft article at <http://support.microsoft.com/kb/929851>.

Note: The exact for parameters for the **netsh** command's start and num parameters depend on your precise system configuration and which ports on the server might already be allocated. The values shown below are only examples:

```
| start=15000
```

```
| num=50000
```

Increasing the GC or GP server's Java Heap Size

You might find the need to change the size of the memory heap of the Java Runtime Engine (JRE). These are the steps.

The heap size must be set depending on your hardware configuration, such as amount of physical memory or number of CPUs. Overallocating memory can cause other performance issues.

BlackBerry recommends that you set the size of the GP server's Java heap to 60% of physical memory, with an upper limit not to exceed 5 GB. If you think it necessary to allocate more than this, get guidance from Good Technical Support.

To increase the GC or GP server's Java heap size:

Installing the BlackBerry Dynamics servers and database

You should be familiar and comfortable with using the Windows Registry Editor (**regedit** command). The HKEY entries in the registry for GC and GP are as follows:

GC	HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Apache Software Foundation\Procrun 2.0\GoodControl\Parameters\Java
GP	HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Apache Software Foundation\Procrun 2.0\GPS\Parameters\Java

1. Stop the GC or GP server. See [Stopping the GC and GP Servers](#).
2. Login to the GC or GP server as administrator.
3. Start the Windows Registry Editor (**regedit** command).
4. Find the desired entry in the registry tree for either GC or GP.
5. Under the **Java** node, set the values of following keys to the desired settings. These keys correspond to the similarly named options on the JRE command:

Important: The initial values for both keys should be the same.

- **JvmMs:** Amount of memory in megabytes to allocate to the Java Virtual Machine at start
- **JvmMx:** Maximum amount of memory in megabytes to allocate to the Java Virtual Machine

6. Save your changes to the registry.
7. Start the GC or GP server. See [Starting and Restarting the GC and GP Servers](#).

BlackBerry device and application management deployment models

BlackBerry device management and application management are features of the Good Control server. As such, it is deployed in the same way as Good Control. There are two deployment models, in both of which the servers and other aspects of the management features are hosted by BlackBerry:

- **Good Control Cloud.** In this model, an administrator can provision all major components of the solution in BlackBerry's cloud, including a Good Control server.
- **On-premise.** In this model, the Good Control and Good Proxy servers are deployed on the customer's premises. Good Control and Good Proxy servers need connectivity to the BlackBerry NOC.

BlackBerry device management and app management installation procedure

Device Management and AM are deployed along with Good Control itself. No additional installation or configuration is necessary.

Installing SSL certificates on GC and GP servers

If your enterprise has its own Certificate Authority (CA) to issue SSL certificates that you use to secure network connections, the discussion, best practices, and caveats of working with them and the GC, the details here are essential to you. If not, you do not need these details.

Formerly, Good Control required you to use the Java `keytool` command to store enterprise certificates (that is, custom certificates your own enterprise generates as a Certificate Authority (CA) and add those certificates to Good Control keystore.

Note: Direct editing of the keystore is not required or supported in this release. This function is now done via the GC console.

Best practices with enterprise-CA-issued certs

These recommendations are to avoid problem scenarios described here. The re-upload needs careful planning and timing of execution.

Essentially, you must make sure that your network peripherals and end-user client apps are prepared before you re-upload and that your GP servers are accessible and running.

- | [Pre-upgrade: save your enterprise CA certs](#)
- | [Network peripheral setup: certs pre-loaded](#)
- | [Client app setup: latest versions installed on devices before re-upload of certs](#)
- | [Client apps running at time of cert re-upload](#)
- | [Timing the exact re-upload: cert effective date/time](#)
- | [At time of re-upload, Good Proxy clusters must be accessible and running](#) Pre-upgrade:

save your enterprise CA certs

Be sure to save copies of your enterprise certificates before you upgrade. After your upgrade is complete, you will re-upload the enterprise certificates to Good Control. [Network](#)

[peripheral setup: certs pre-loaded](#)

Before re-uploading your enterprise-CA-issued certs into the GC, make sure that *all* your network connection devices are pre-loaded with your certs.

This best practice relates to *all* network devices that you protect via your certs: switches (such as F5), routers, load balancers, web proxies, app servers: all equipment that already relies on your certs.

This best practice includes devices that are configured to use the Direct Connect network configuration. If you do not prepare these peripherals in advance, the GC cannot establish a secure connection to them.

Installing the BlackBerry Dynamics servers and database

Client app setup: latest versions installed on devices before re-upload of certs

Before re-uploading your enterprise-CA-issued certs into the GC, make sure that all BlackBerry Dynamics-based apps are upgraded to the latest versions released along with this version of the GC. Also make sure that these latest apps are fully deployed to all end-users that require them.

- | This applies to apps distributed by BlackBerry, such as BlackBerry Access, BlackBerry work, and so on.
- | This advice also includes any BlackBerry Dynamics-based apps your enterprise itself has developed and deployed. They must be rebuilt with the latest version of the BlackBerry Dynamics SDK and must be re-deployed *prior* to re-uploading certs into the GC.

Without this best practice, the older apps cannot communicate with the GC to receive your re-uploaded enterprise-CA-issued certs, and end-users will have to re-provision them on their devices.

Client apps running at time of cert re-upload

All the affected apps that have been rebuilt with the latest BlackBerry Dynamics SDK and re-deployed to all end users *must be running (in the background or otherwise) when you re-upload the certificate.*

If not, the app will not receive the new cert, and the next time it starts, it will not be able to secure the connection. Timing the exact re-upload: cert effective date/time

Be sure that the effective date of your certs is not less than the GC policy for connectivity checking of client apps. Be sure that you allow sufficient time for re-uploaded certs to propagate to connected GP clusters and devices.

BlackBerry recommends a minimum interval of 30 minutes. That is, stagger the effective time for all the certs so that they take effect in sequence, at least 30 minutes apart.

Important: The exact length of time you need to wait for propagation depends on which certs you are replacing and how many there are. If you are replacing only one cert for server-to-server communication, 10 minutes might be sufficient, because there are not many servers involved.

However if you are replacing the certs used for communication with apps on devices (those on the GC's **Client Certificates** tab), you should allow much longer than 30 minutes, depending on the number of deployed apps. The greater the number of apps, the longer you should allow between re-uploading certs.

At time of re-upload, Good Proxy clusters must be accessible and running

Before re-uploading your enterprise-CA-issued certs into the GC, make sure that *all* your GP clusters and servers are accessible via the network and are running.

Otherwise, you will have to manually reload your certs on each GP server that was not accessible and running at the time you re-upload your certs into the GC console.

Mechanisms to load certs into the GC

Options to re-upload your enterprise-CA-issued certificates in Good Control:

Installing the BlackBerry Dynamics servers and database

⌋ In the GC console, use **Settings > Server Certificates**.

⌋ With the SOAP APIs `RenewCertificate` or `RenewCertificatesByCertDefId`

Forcing import certificates into Good Proxy if necessary: install repair

This topic is important for you only if your Good Control server and Good Proxy are not communicating and you suspect a problem with your enterprise-CA-issued SSL certificates.

To avoid problems when you re-upload your enterprise-CA-issued, follow the best practices detailed in [Pre-upgrade: save your enterprise CA certs](#).

Good Control and Good Proxy secure their own communications by way of an SSL certificate. If you load an SSL certificate into GC, the same certificate details are also updated on the GP *unless the GP is not reachable when you load the new certificate into the GC*. In this case, you will have to manually load the pertinent SSL certificate or certificates onto every GP that fails to communicate with its GC.

To correct this problem and to re-load your own certs into the affected GP servers, run the GP installation program and select the repair option.

Enabling info logging for a GC server

GC relies on the well-known log4j software to set the density (amount of detail) of its logging.

Decommissioning Good Control or Good Proxy

The highest level of detail, debug logging (or "DEBUG"), is useful for finding the cause of problems. It can also make your logfiles' size extremely large. For normal operations, it is best to run with logging set to "info" level to keep the logfile size to a minimum.

You can change the logging level for each individual GC server as needed.

Follow these instructions for each GC server you want to enable "info" logging on:

1. Log into the GC server host machine.
2. Navigate to the directory where GC keeps the logging properties; for example, on Windows, `C:\Program Files\BlackBerry\Good Control\webapps\gc-server\WEB-INF\classes`.
3. Make a backup of the `log4j.properties` file.
4. In the `log4j.properties` file, change all occurrences of `DEBUG` to `INFO`.
5. Save the file.
6. Restart the GC service.

Decommissioning Good Control or Good Proxy

For background on the behavior of inactive containers, see [Behavior and Model of Disconnected/Inactive Containers](#).

A container might continue to connect to a GP and through it to an application server, even if does not also and always connect to a GC. This ability is limited, however, and is only possible if the container is still within the container inactivity/purge threshold. Given this intentional ability of the GD Runtime and GP to operate independently of GC for limited periods of time, before fully decommissioning a GP cluster:

Important: It is best practice to bring up the new cluster and keep the old cluster running for a transitional period of time equal to the configured container inactivity/purging period.

Doing so ensures that all actively used containers will both connect to GP and to GC within the transitional period and, by doing so, obtain the updated Connectivity Profile from GC that subsequent container connections to the 'new' GP cluster.

Meanwhile, any remaining containers that do not connect to the old GP cluster within that transitional period and from there to GC will (and should) be purged anyway as a matter of security practice and to guard against the possibility that a container continues to connect to GP, within Connectivity Verification period, but without connecting to GC itself.

For example, if you set Connectivity Verification period to 30 days and Inactivity threshold to 60 days, then you should allow 60 days for transition to complete. Active containers connecting to GC within that day period will obtain updated Connectivity Profiles, inactive containers will be purged anyway and will receive Connectivity Profile on re-activation.

The reason that the Connectivity Verification period is less than the Inactivity threshold is that this allows for $n >$ where certain apps are more infrequently by their nature. In such case, the administrator wants to guard against where someone maliciously keeps offline, but the administrator also wants a legitimate user to be able to unblock without loss of data by using the 'block' vs. 'wipe' action. This is less impactful on the end-user than 'wiping' or 'purging'.

High-level steps for upgrading GC or GP

It does not make sense to have a Connectivity Verification period that is greater than Inactivity threshold. By definition, a container that reaches GC through GP in first place will have satisfied Connectivity Verification compliance rule. So, it is not possible to have actively connected to GC within last 60 days, for instance, and not have also connected to GP within that same time.

Uninstalling the GC or GP server

You can use the installation program for GC or GP to uninstall the server software.

Note: After installation, although the software itself is removed, the GC or GP server software is still listed in the Installed Programs.

High-level steps for upgrading GC or GP

These are the high-level steps for upgrading the GC and GP.

Earlier releases of BlackBerry Dynamics servers

A list of all released versions of Good Control and Good proxy, including downloadable software, is at <https://community.good.com/docs/DOC-1054>

Rule of thumb about incremental (or "stepwise") upgrades

The exact steps for upgrade are version-dependent. The release notes for GC and GP always state what earlier versions can be upgraded.

Note: Upgrades of Good Control and BlackBerry proxy are "stepwise": you can upgrade directly to the latest version from versions that are no more than two major releases behind the latest release .

You can step over more than one version; that is, instead of installing each and every intervening version, you can go more directly to the final, desired version.

A *major version* is defined by the first two numbers of the full version number, disregarding the last two numbers. For example, 2.0, 2.1, and 2.2 are all major major releases.

Consider the following example case. Current version is you have installed Good Control version 1.10.xx.yy and want to upgrade to the latest version. The stepwise path for upgrade is as follows:

1. Upgrade from version 1.10.xx.yy to version 2.0.xx.yy.
2. Then, upgrade from version 2.0.xx.yy to version 2.2.xx.yy, skipping over version 2.1.xx.yy.

Depending on your currently installed version, to upgrade to the latest version of Good Control, you might have to do the necessary intervening versions of Good Control between your currently installed version until you reach a version that allows you to step over two major release to the desired version.

General upgrade steps for each Good Control or Good Proxy cluster

These steps are generalized and serve as a high-level approach. Be sure you analyze your configuration to take into account any configuration or deployment variations that cannot be included in these generalized steps.

Before you begin, determine your upgrade path. See the discussion in [Rule of thumb about incremental \(or "stepwise"\) upgrades](#).

For each incremental version to upgrade for each system in the Good Control cluster or Good Proxy cluster:

1. Backup the system according to the *Backup and Restore Guide* at [BlackBerry Dynamics Server Backup and Restore](#), including the installation and installed directories, and certificate files.

Optional: On each GP node, back up its respective **C:\good** directory and the *Good_Proxy_install_dir\jre\lib\security\cacerts* file. Because the GP is stateless, it's just as easy to uninstall and reinstall (rather than restore) the GP if something goes wrong. The GC is not stateless; you must back up that server.

2. Do not delete your current working license on the GDN.
3. Shut down the Good Control and Good Proxy service on each of the cluster nodes.
4. Upgrade one system and bring it back up to ensure it has migrated and you can log into the console. Then upgrade the remaining nodes.
5. Upgrade the corresponding GP servers.

Restoring custom (enterprise-issued) certificates from backup

Custom (enterprise-issued) certificates added to the Good Control or Good Proxy keystore before an upgrade are not retained during the upgrade. This article describes the manual steps to import these custom certificates from a backup in to the Java Key Store (JKS).

During upgrade a backup directory is created to preserve customized and standard files, The backup is stored in a date-stamped folder and the certificates are stored in the key store file **cacerts**, like so:

- | GoodProxy: **C:\Program Files\Good Technology\Good Proxy Server\backup\date_time_of_backup\cacerts**
- | GoodControl: **C:\Program Files\Good Technology\Good Control\backup\date_time_of_backup\cacerts**

Steps

Be sure to have the Java **keytool** command in your path; otherwise, you need to execute the **keytool** command from the Java Runtime Engine (JRE) **bin** directory.

High-level steps for upgrading GC or GP

Note: The steps are the same for Good Control and Good Proxy *except* for Step 7, recording the restored certificate alias on the server and the path names to the necessary files. The example steps here use Good Proxy; if you are working on Good Control, change the path names appropriately as shown above.

In the steps below, we use the following values as an example. You need to substitute these values for your own backup directory and the aliases of the certificates:

- | Example backup folder and key store: **C:\Program Files\Good Technology\Good Proxy Server\backup\2017-01-01_00-00-01\cacerts**
- | Example custom enterprise-issued certificate alias: gd-qa002
- | Example custom root certificate alias: amazingca

1. Login to the server as administrator.
2. Stop the service. See [Stopping the GC and GP Servers](#).
3. Locate the backup directory with JKS file; in this example, **C:\Program Files\Good Technology\Good Proxy Server\backup\2017-01-01_00-00-01\cacert.jks**
4. Make sure that custom and root certificates are in the list:
 - | Example custom certificate gd-qa002

```
keytool -list -alias gd-qa002 -keystore "C:\Program Files\Good Technology\Good Proxy Server\backup\2017-01-01_00-00-01\cacerts"
```

- | Example custom root certificate amazingca

```
keytool -list -alias amazingca -keystore "C:\Program Files\Good Technology\Good Proxy Server\backup\2017-01-01_00-00-01\cacerts"
```

5. Extract the certificates from the backup JKS file to a PKCS12 file:

- | Example custom certificate gd-qa002

```
keytool -v -importkeystore -srckeystore "C:\Program Files\Good Technology\Good Proxy Server\backup\2017-01-01_00-00-01\cacerts" -srcalias gd-qa002 -destkeystore gd-qa002.p12 -deststoretype PKCS12 -deststorepass changeit -destkeypass changeit
```

- | Example custom root certificate amazingca

```
keytool -v -importkeystore -srckeystore "C:\Program Files\Good Technology\Good Proxy Server\backup\2017-01-01_00-00-01\cacerts" -srcalias amazingca -destkeystore amazingca.p12 -deststoretype PKCS12 -deststorepass changeit -destkeypass changeit
```

6. Import the PKCS12 certificates into the active JKS.

Note: The argument **changeit** in these example commands is the default keystore password for Good Control and Good Proxy. If you have changed the keystore password, use that password instead of **changeit**.

Important: On Windows 10, you need only the first **keytool** command shown here to import the root certificate of the CA (in this example, the amazingca alias); **keytool** will then import the associated certificates authorized

High-level steps for upgrading GC or GP

by that CA (in this example, the gd-qa002 alias). On other operating system versions, you might need to enter both **keytool** commands shown here.

Example custom certificate amazingca

```
keytool -v -importkeystore -srckeystore amazingca.p12 -srcstoretype pkcs12 -srcstorepass changeit -destkeystore "C:\Program Files\Good Technology\Good Proxy Server\jre\lib\security\cacerts" -deststoretype jks -deststorepass changeit
```

Example custom root certificate gd-qa002

```
keytool -v -importkeystore -srckeystore gd-qa002.p12 -srcstoretype pkcs12 -srcstorepass changeit -destkeystore "C:\Program Files\Good Technology\Good Proxy Server\jre\lib\security\cacerts" -deststoretype jks -deststorepass changeit
```

7. Record the restored certificate in the server's configuration file.

GoodProxy

Edit the file `C:\good\gps.properties` to record the names of the custom keystore alias as the value of the `gd.security.keystore.alias` property:

```
gd.security.keystore.alias=gd-qa002
```

GoodControl

Edit the server's file `C:\Program Files\Good Technology\Good Control\apache-tomcat-8.0.36\conf\server.xml` to add `keyAlias="gd-qa002"` as highlighted below:

```
.
.
.
<Connector protocol="org.apache.coyote.http11.Http11Protocol"
  port="443" SSLEnabled="true"
  maxThreads="150" scheme="https" secure="true"
  clientAuth="want" sslEnabledProtocols="TLSv1,TLSv1.1,TLSv1.2"
  maxHttpHeaderSize="65536"
  compression="on"
  compressableMimeType="text/html,text/xml,text/plain,text/css,text/javascript,text/json,application/json,application/x-javascript,application/javascript,image/png,image/gif,image/jpeg"
  keyAlias="gd-qa002"
  keystoreFile="..\jre\lib\security\cacerts" keystorePass="{gd.security.keystore.password}"
  truststoreFile="..\jre\lib\security\cacerts" truststorePass="{gd.trustStore.password}"
  keyPass="{gd.keyPass}"
  ciphers="TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384,TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384,TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA,TLS_DHE_RSA_WITH_AES_256_GCM_SHA384,TLS_DHE_RSA_WITH_AES_256_CBC_SHA256,TLS_DHE_RSA_WITH_AES_256_CBC_SHA,TLS_ECDH_RSA_WITH_AES_256_GCM_SHA384,TLS_ECDH_RSA_WITH_AES_256_CBC_SHA384,TLS_ECDH_RSA_WITH_AES_256_CBC_SHA,TLS_RSA_WITH_AES_256_GCM_SHA384,TLS_RSA_WITH_AES_256_CBC_SHA256,TLS_RSA_WITH_AES_256_CBC_SHA" server=" "
/>
.
.
.
```

8. Restart the server. See [Starting the GC and GP Servers](#)

High-level steps for upgrading GC or GP

9. Verify the results with your browser. Navigate to:

┆ Example for GoodProxy

`https://your_gp_server:17433/status`

┆ Example for Good Control

`https://your_gc_server/gc/status`

In either case, the results should be the display of the status of the system. Any other response indicates the process was not successful.

Another mechanism to verify the certificates on the running server is to use your browser's tools to display the credentials of the server. The steps for this are different for different browsers, but in each case (continuing our example names), the root certificate should be displayed as **amazingca** and the custom certificate as **gd-qa002**.

BlackBerry Dynamics documentation

Category	Title	Description
Cross-platform	<ul style="list-style-type: none"> ▪ Getting Started Guide for Marketplace Partners ▪ Good Control/Good Proxy Platform Overview for Administrators and Developers ▪ Good Cloud Deployment 	Overviews of the BlackBerry Dynamics system
	<ul style="list-style-type: none"> ▪ Good Control Device and Application Management ▪ Good Control Device Management Enrollment: Good Agent for iOS ▪ Good Control Device Management Enrollment: Good Agent for Android 	Device and application management on Good Control, including app distribution, with client-side device enrollment details
Security	BlackBerry Dynamics Security White Paper	Description of the security aspects of BlackBerry Dynamics
	BlackBerry Dynamics and Fingerprint Authentication	Discussion of the implementation of BlackBerry security with fingerprint recognition systems: Apple Touch ID and Android Fingerprint
BlackBerry UEM	BlackBerry UEM Administration Guide	Approaches to administering the BlackBerry Unified Endpoint Manager
	Getting Started with BlackBerry UEM and BlackBerry Dynamics	Introductory material to administering the BlackBerry UEM with the BlackBerry Dynamics profile
Good Control	<ul style="list-style-type: none"> ▪ BlackBerry Secure Enterprise Planning Guide ▪ BlackBerry Secure Servers Compatibility Matrix ▪ BlackBerry Performance Calculator 	Guidelines and tools for planning your BlackBerry Secure Enterprise deployment
	Good Control/Good Proxy Server Preinstallation Checklist	Same checklist extracted from the installation guide below
	Good Control/Good Proxy Server	Details on installing Good Control, Good Proxy, and the GC

BlackBerry Dynamics documentation

Category	Title	Description
	Installation	database
	Kerberos Constrained Delegation for Good Control	Configuration details for integrating the Kerberos authentication system with BlackBerry Dynamics
	Direct Connect for Good Control	Configuring BlackBerry Dynamics servers to securely access internal resources from the external Internet
	Good Control Easy Activation Overview	A look at the Easy Activation feature
	Good Control/Good Proxy Server Backup and Restore	Minimal steps for backing up and restoring the BlackBerry Dynamics system
	Good Control Online Help Good Control Server Property and Security Policy Reference	Printable copy of the GC console online help
	PKI Cert Creation via Good Control: Reference Implementation	A reference implementation in Java for creating end-user PKI certificates via Good Control and a Certificate Authority (CA)
	Good Control Cloud Online Help	Printable copy of the Cloud GC console online help
	Technical Brief: BlackBerry Dynamics Application Policies with XSD for app-policy XML	Description of formatting application policies for use in Good Control, with examples.
	Development Guide: Good Control Web Services	<p>Programmatic interfaces on Good Control</p> <ul style="list-style-type: none"> ▫ Basic control and application management: SOAP over HTTPS. Documentation is in the WSDL files included with GC. ▫ Device management: HTTPAPI(withJSON) for device management. Zipfile of API reference.
Software Development	Developer Bootstrap: Good Control Essentials	Bare minimum of information that a developer of BlackBerry Dynamics applications needs to get started with the Good Control server to test applications.
	BlackBerry Dynamics Shared Services Framework	Description of the BlackBerry Dynamics shared services framework for software developers
Android	<ul style="list-style-type: none"> ▫ Development Guide: BlackBerry Dynamics SDK for Android ▫ API Reference for Android 	Working with the BlackBerry Dynamics SDK for Android and the essential reference for developers
iOS	<ul style="list-style-type: none"> ▫ Development Guide: BlackBerry Dynamics SDK for 	Working with the BlackBerry Dynamics SDK for iOS and the essential reference for developers

BlackBerry Dynamics documentation

Category	Title	Description
	iOS <ul style="list-style-type: none"> ▪ API Reference for iOS 	
macOS	<ul style="list-style-type: none"> ▪ Development Guide: BlackBerry Dynamics SDK for macOS ▪ API Reference for macOS 	Working with the BlackBerry Dynamics SDK for macOS and the essential reference for developers
Windows	<ul style="list-style-type: none"> ▪ Development Guide: BlackBerry Dynamics SDK for Universal Windows Platform (UWP) ▪ API Reference for UWP 	Working with the BlackBerry Dynamics SDK for Universal Windows Platform (UWP) and the essential reference for developers
iOS, Android	BlackBerry Launcher Library	Source code and header files for implementing the popular BlackBerry Launcher interface
Cross-platform	Development Guide: BlackBerry Dynamics SDK for Cordova for iOS and Android	Working with the BlackBerry Dynamics SDK for Cordova plugins
	BlackBerry Dynamics Bindings for Xamarin.Android	Working with the BlackBerry Dynamics SDK and the Xamarin cross-platform integrated development environment
	BlackBerry Dynamics Bindings for Xamarin.iOS	Working with the BlackBerry Dynamics SDK and the Xamarin cross-platform integrated development environment