Leveraging IBM Rational ClearCase and ClearQuest CM Server to achieve a secure, centralized, and flexible deployment model in your GDD environment

Sujeet Mishra

Senior Staff Software Engineer IBM

sujmishr@in.ibm.com

Innovate2010

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August 16-18, Bangalore

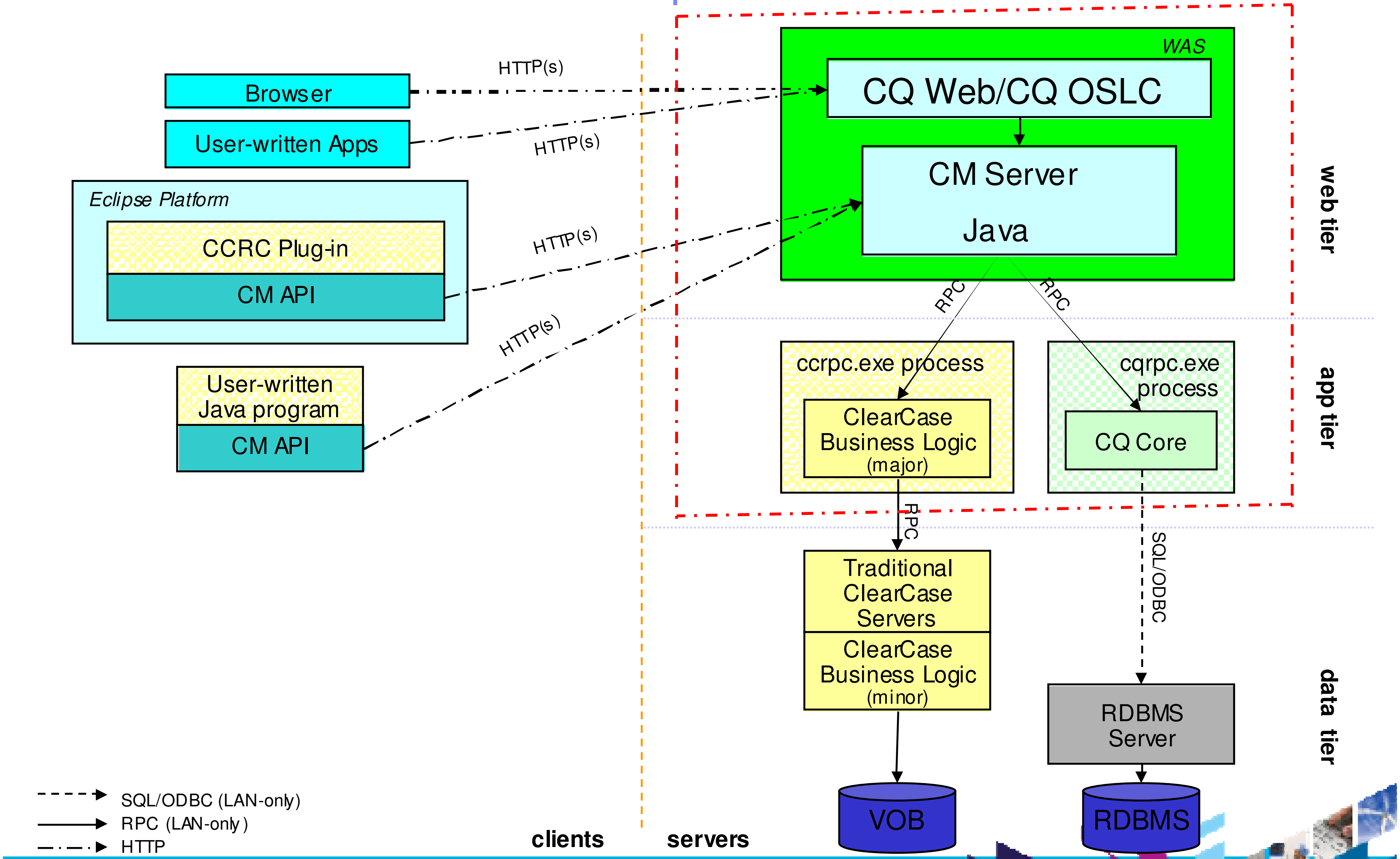
Agenda

- Introduction to CM Server
- Secure your CM Server environment
  - Enable WAS admin security
  - Control access by host name or address
  - Configure SSL with IHS
  - Use Proxy Server
- Centralized and Flexible deployment leveraging CM Server
  - Backward (cross version) compatibility and flexibility in adoption
  - Consolidate multiple sites with load balancing
  - Use region mapping
  - [New] ClearCase-ClearQuest integration option for increased flexible deployment

What is CM Server?

- CM Server stands for Configuration Management Server and/or Change Management Server.
- It is a unified (single technology stack) application server for both ClearCase and ClearQuest.
- First released in ClearCase and ClearQuest version 7.1.
- Design Goals of CM Server
  - Drive down TCO (Total Cost of Ownership)
    - Support WAN clients (CCRC, CQ Web, Full Text Search…)
    - Lower client installation and client administration costs
    - Standardize configuration and administration of servers
  - Leverage performance, security & scalability of WebSphere Application Server.
  - Lift limitations of previous CCRC Server and CQ Web Server.
  - Support a new, unified client-side Java API for custom integrations.
  - Support the new ClearQuest OSLC interface for building loosely-coupled and robust integrations.

CM Server Architecture – Component view



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Secure your CM Server environment
* Enable WAS administrative security

- CM Server is a Websphere Application Server (WAS) Hosted J2EE application.

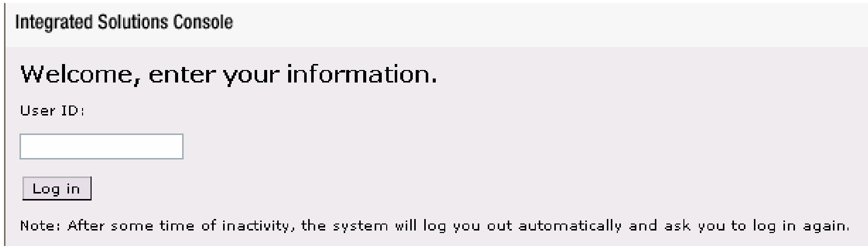
- Administrative security protects the CM Server from unauthorized access to the WAS administrative functions e.g.
  - WAS administrative console.
  - Modifications to WAS configuration.
  - Stopping the WAS instance.

- Administrative security not enabled by default
  - When a WAS profile created, the administrative security is disabled by default.
  - Security could be enabled by default in the future based on customer feedback.

- **It is very important to enable WAS administrative security.**

Secure your CM Server environment
* Enable WAS administrative security

- **Enable WAS administrative security**
  - Login to WAS admin console via http://cmserver:12060/ibm/console



Integrated Solutions Console

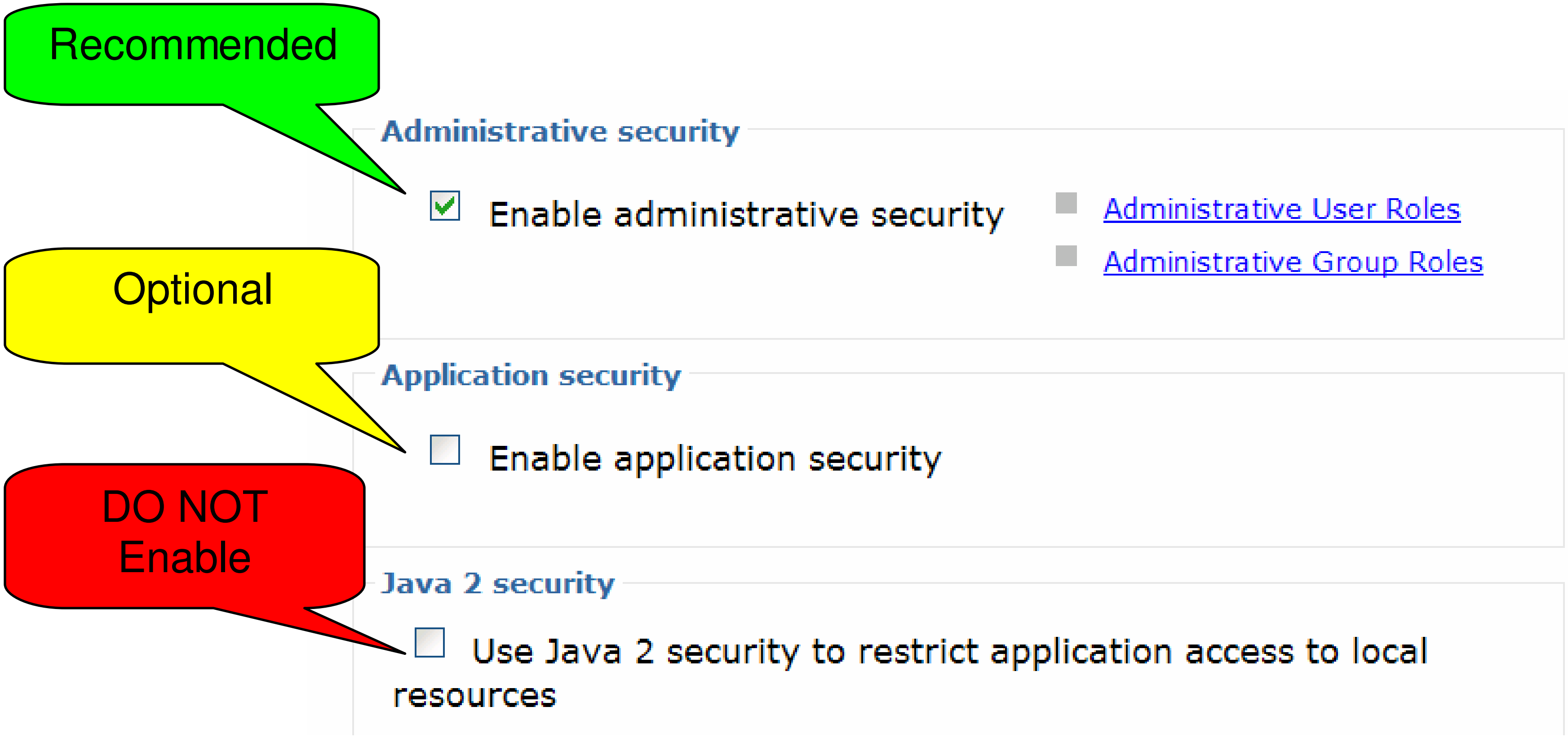
Welcome, enter your information.

User ID:

Note: After some time of inactivity, the system will log you out automatically and ask you to log in again.

- Follow Security > Secure administration, applications, and infrastructure.
  - Use the Security Configuration wizard to configure security
    - In step 1 of the wizard, select a security level. Ensure that **Java 2 security** is disabled.
    - In step 2, select a user repository. Choose one of federated or LDAP repositories. For more information, see the WebSphere Application Server v6.1 Information Center.
    - In step 3, enter the administrative user name and password. The user name must be different from the user name that is running WebSphere Application Server.
    - In step 4, confirm your selections and click **Finish**.
    - Click **Apply**.

Secure your CM Server environment
* Enable WAS administrative security



Recommended

Administrative security

☑ Enable administrative security

- Administrative User Roles
- Administrative Group Roles

Optional

Application security

□ Enable application security

DO NOT Enable

Java 2 security

□ Use Java 2 security to restrict application access to local resources

Secure your CM Server environment
* Enable WAS administrative security

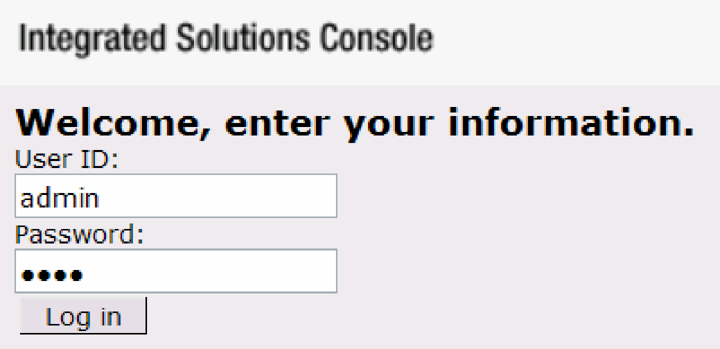
Enable ClearQuest Web for CM Server administrative security.

- Edit the file CqServerConn.properties. The location of the file is:
  - On Windows:
    <*drive*>:\install_dir\common\CM\profiles\cmprofile\installedApps\node-name\RationalClearQuestWeb.ear\CQWebModule.war\WEB-INF\classes\CqServerConn.properties
  - On UNIX system and Linux:
    install_dir/common/CM/profiles/cmprofile/installedApps/*node-name*/RationalClearQuestWeb.ear/CQWebModule.war/WEB-INF/classes/CqServerConn.properties
- Add the administrative user name and password to the following lines
  TEAM_SERVER_ADMIN_AUTHENTICATION_KEY=
  TEAM_SERVER_ADMIN_AUTHENTICATION_VALUE=
- Restart CM Server for the administrative security changes to take effect.

Secure your CM Server environment
* Enable WAS administrative security

After administrative security is enabled …

- The administrative user name and password must be provided when:
  - Log into the WAS administrative console
    - – http://server:12060/ibm/console



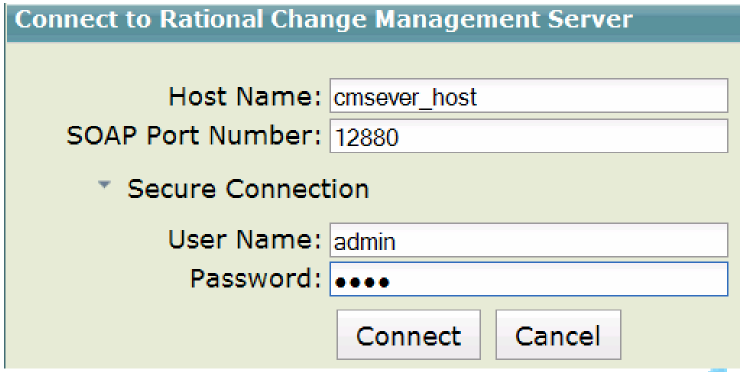
Integrated Solutions Console

Welcome, enter your information.

User ID: admin

Password: ●●●●

  - Log into the CM Server administration utility (technote # **1377925)**
    - – http://server/TeamAdminWeb



Connect to Rational Change Management Server

Host Name: cmsever_host

SOAP Port Number: 12880

Secure Connection

User Name: admin

Password: ●●●●

Secure your CM Server environment
* Enable WAS administrative security

After administrative security is enabled (contd.) …

- **Stop the CM server**.
  - (Windows Only) If *stopServer* script is used, the user and password arguments must be provided as command line arguments:

    $install_dir\common\eWAS\bin stopServer.bat -user <*admin-user-name*> -password <*admin-password*>

  - (Unix and Linux): The *cmserver_shutdown* and *cmserver_restart* scripts also accept the -user and -password arguments.
    - /opt/IBM/RationalSDLC/common/CM/bin/cmserver_shutdown/restart

- **Update the WAS Service on Windows**
  - CM Server runs as a Windows service. Update the service with additional arguments for the administrative user name and password used when stopping/starting the CM Server.
  - Run the following commands in a command prompt window, substituting <*admin-user-name*> and <*admin-password*> with the administrative user name and password, respectively.
    - Step 1: cd *$install_dir*\common\eWAS\bin
    - Step 2: **WASService.exe** -add "cmprofile" -serverName server1 -profilePath "$*install_dir*\common\CM\profiles\cmprofile" -stopArgs "-user <*admin-user-name*> -password <*admin-password*>" -encodeParams

Secure your CM Server environment

* Enable WAS administrative security

Security Considerations for Unix and Linux

- Passing the administrative user name and password to the *stopServer.sh* script exposes the user name and password to anyone who issues the ps -ef command.

- To avoid specifying the -user and -password options for commands, configure the settings as properties:
  - cd /opt/rational/common/CM/profiles/cmprofile/properties
  - Edit the file **soap.client.props** and change the values of the following properties:
    - com.ibm.SOAP.securityEnabled=true
    - com.ibm.SOAP.loginUserid=<*admin-user-name*>
    - com.ibm.SOAP.loginPassword=<*password*>
  - Encode the property value com.ibm.SOAP.loginPassword by running the following script:
    - opt/rational/common/eWAS/bin/PropFilePasswordEncoder.sh soap.client.props com.ibm.SOAP.loginPassword
    - Verify that the password is encoded and then remove the file soap.client.props.bak.

- Check permissions on sensitive WAS files e.g properties and executables. Permissions should limit access to WebSphere administrators.

Secure your CM Server environment

* Enable WAS administrative security

Upgrading CM Server

- Administrative security **must** be temporarily disabled prior to upgrading the CM Server .

- Disabling and Administrative Security
  - Start the WebSphere Application Server administrative console by entering the following URL in your browser window: http://localhost:12060/ibm/console
  - Log in by using the administrative user name and password.
  - Click **Security > Secure administration, applications, and infrastructure**.
  - Clear **Enable administrative security**.
  - Click **Apply** to save your changes
  - Restart CM Server to effect the changes.

Additional Resources

Refer to technote **#1386762** for additional information on managing WAS administrative security.

Secure your CM Server environment
* Control Access by host name or address

- Access to the CM Server can be controlled via an access list including the name or address of the host to be included or excluded.
  - This can be done by configuring the Websphere Application Server web container transport chain.
    - Login to http://server:12060/ibm/console
    - Follow Server → Application Servers → server1
    - Access the **Configuration** tab. In the **Container Settings** section, expand **Web Container Settings**.
    - Click on **Web container transport chains**
    - Click on **WCInboundDefault**
    - Add the host name or address to the exclude or include list.
    - Click “Apply” and restart CM Server
- Technote #**1397016** discusses steps to secure the WAS profile used by ClearQuest Full-Text Search service. These steps can be applied to other WAS profiles, such as CM Server “cmprofile” with variation in ports used.

Secure your CM Server environment
* Configure SSL access using IBM HTTP Server (IHS)

- It is highly recommended to configure CM Server to use the Secure Socket Layer (SSL) protocol for secure communication with ClearCase Remote Client (CCRC) and ClearQuest Web.

- The current version (7.1.x) of CM Server does not support Open SSL.
  - A previously created Open SSL certificate must be converted to IBM SSL certificate for use with the CM Server.
  - See the InfoCenter contents on steps to convert Open SSL to IBM SSL.

Secure your CM Server environment
* Configure SSL access using IBM HTTP Server (IHS)

Steps to configure SSL using IHS

- Uncomment the line “Include conf/ssl.conf” in the file %RATIONAL_COMMON%\IHS\conf\httpd.conf.

- Create %RATIONAL_COMMON%\IHS\key.kbd and %RATIONAL_COMMON%\IHS\key.sth using the IHS Key Management utility.
  - Refer to Creating HTTP server keys.

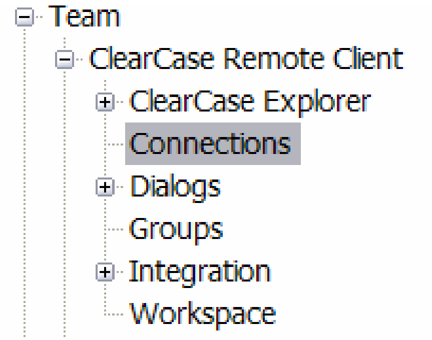
- Create the IBM SSL certificate.
  - Refer to Creating a self-signed certificate for the HTTP server.

- Redirect non-SSL requests as SSL requests.
  - Refer to Forcing an SSL connection with CM Server.

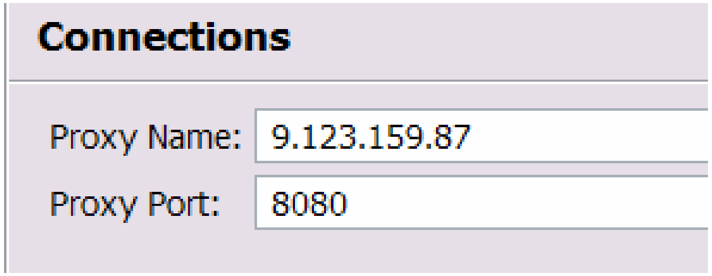
Secure your CM Server environment

* Use Proxy Servers in CCRC/CM Server environment

- **Reverse proxy**
  - User connects / authenticates using URL to proxy server.
- **Forward proxy**
  - CCRC user specifies proxy information in CCRC preferences page.



- Team
  - ClearCase Remote Client
    - ClearCase Explorer
    - Connections
    - Dialogs
    - Groups
    - Integration
    - Workspace

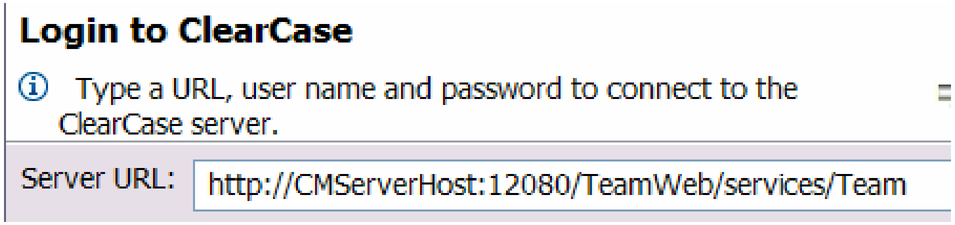


Connections

Proxy Name: 9.123.159.87

Proxy Port: 8080

  - CCRC user connects using CM Server URL



Login to ClearCase

ⓘ Type a URL, user name and password to connect to the ClearCase server.

Server URL: http://CMServerHost:12080/TeamWeb/services/Team

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  - [New] ClearCase-ClearQuest integration option for increased flexible deployment

Centralized Flexible deployment using CM Server

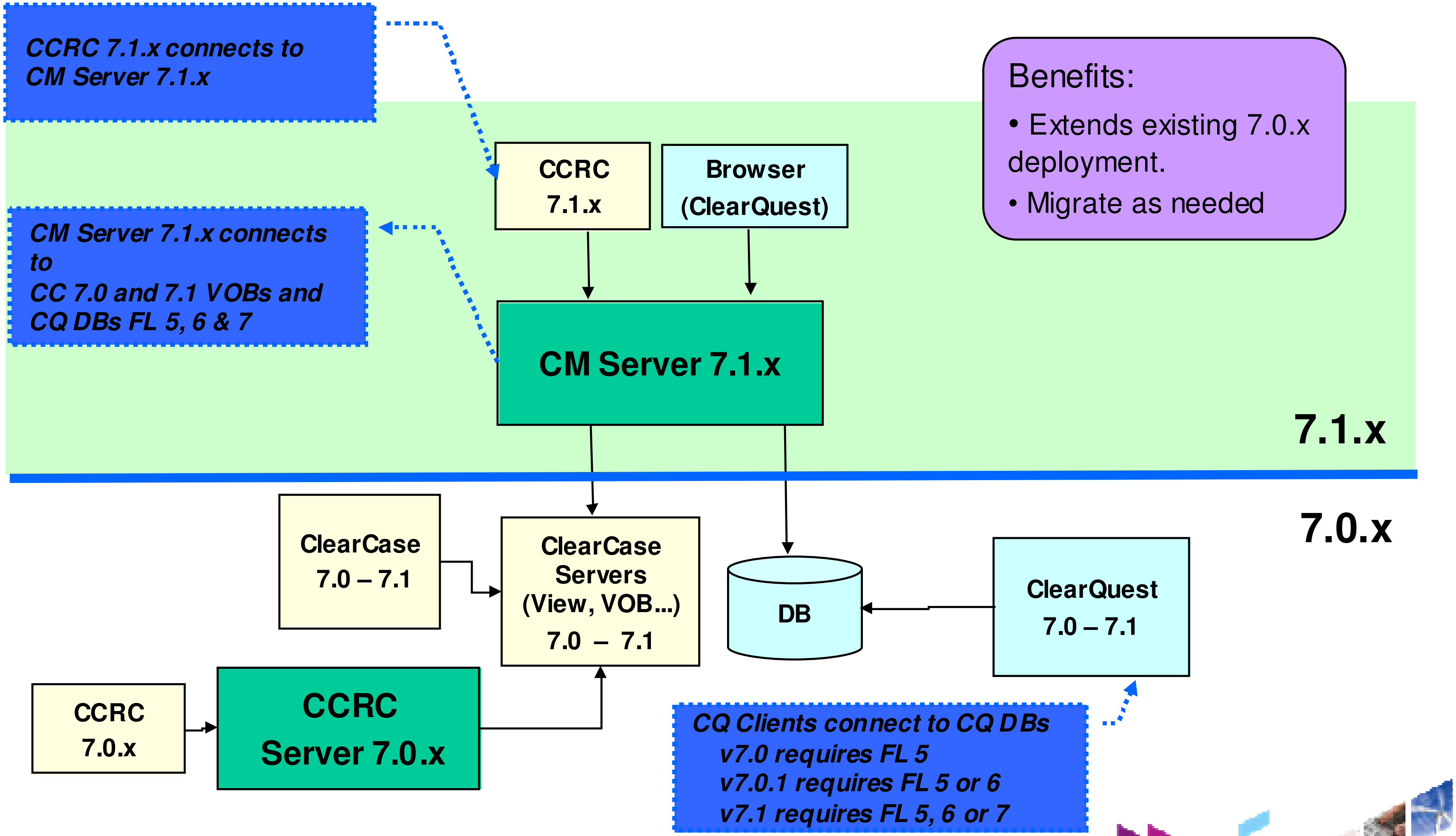
* Backward compatibility and flexibility in adoption

- ClearCase
  - v7.1.x CM Server is compatible with v7.0.x VOB servers
  - Once v7.0.x CCRC server is upgraded to v7.1 CM Server, CCRC client connecting to this CM Server must be upgraded to v7.1 version.
  - V7.0.x CCRC server and v7.1.x CCRC Server (CM server) can access the same v7.0.x VOB servers.

- ClearQuest
  - v7.1 CM Server supports Feature Level 5, 6 and 7 CQ databases
  - CQ Full-Text Search support requires ClearQuest Feature Level 7. However, this is not required for MultiSite'ed CQ DB.

Centralized Flexible deployment using CM Server

* Backward compatibility and flexibility in adoption


CCRC 7.1.x connects to CM Server 7.1.x
CM Server 7.1.x connects to CC 7.0 and 7.1 VOBs and CQ DBs FL 5, 6 & 7
CCRC 7.1.x
Browser (ClearQuest)
CM Server 7.1.x
7.1.x
7.0.x
ClearCase 7.0 – 7.1
ClearCase Servers (View, VOB...) 7.0 – 7.1
DB
ClearQuest 7.0 – 7.1
CCRC 7.0.x
CCRC Server 7.0.x
CQ Clients connect to CQ DBs
v7.0 requires FL 5
v7.0.1 requires FL 5 or 6
v7.1 requires FL 5, 6 or 7

Benefits:

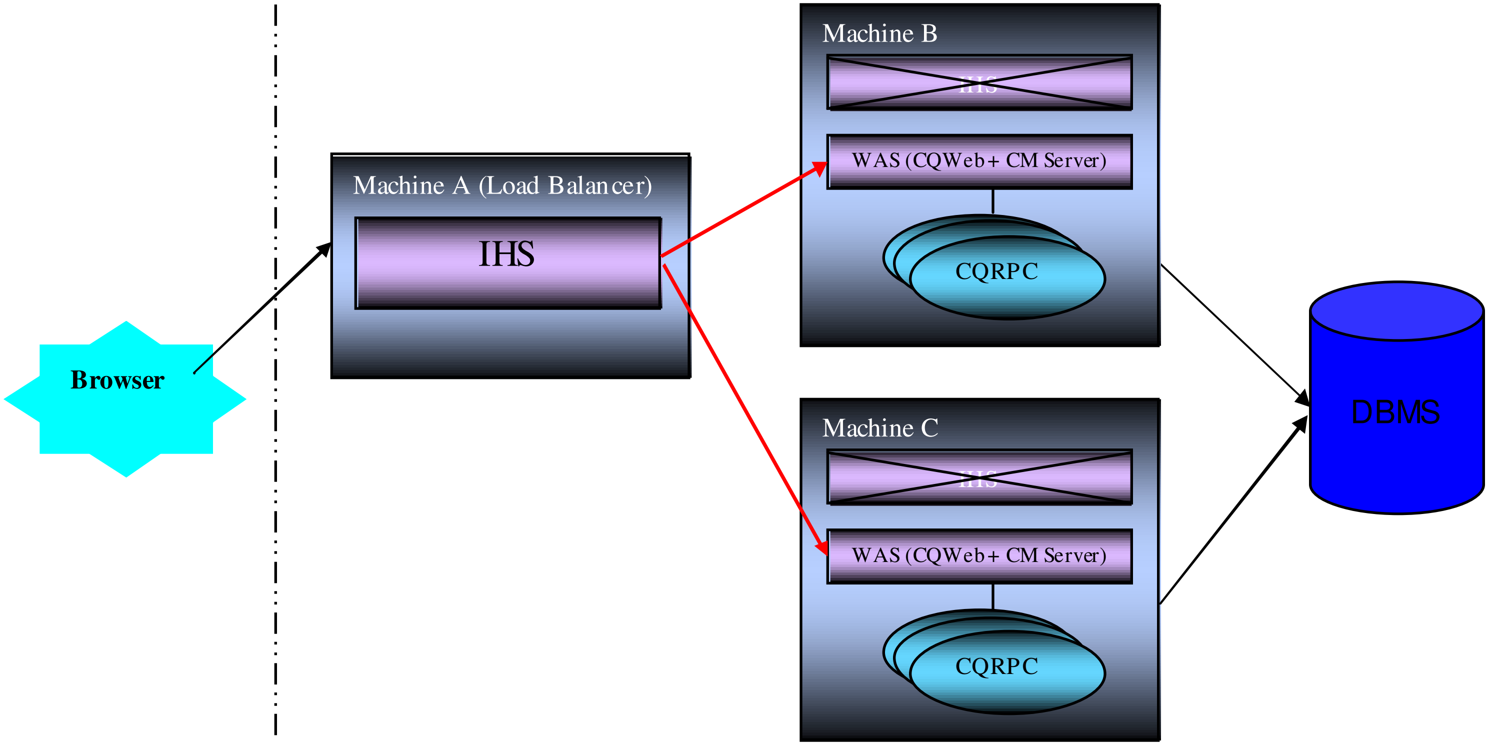
- Extends existing 7.0.x deployment.
- Migrate as needed

Centralized Flexible deployment using CM Server
* Consolidating multiple sites with load balancing

- CM server load balancing options provided with 7.1.x
  - Using IBM HTTP Server – Out of the Box option
    - Provides random / round robin load distribution
    - Configuration technote for CCRC: #**1377474**
    - Configuration technote for CQWeb: #**1377478**
  - Using WebSphere Edge Component (see InfoCenter for details)
    - Edge Component Load Balancer – True Load Balancing
      - Monitors load on CM Server and distributes accordingly
      - Administration Console to monitor load
- Both options provide backup/failover capability.

Centralized and Flexible deployment leveraging CM Server

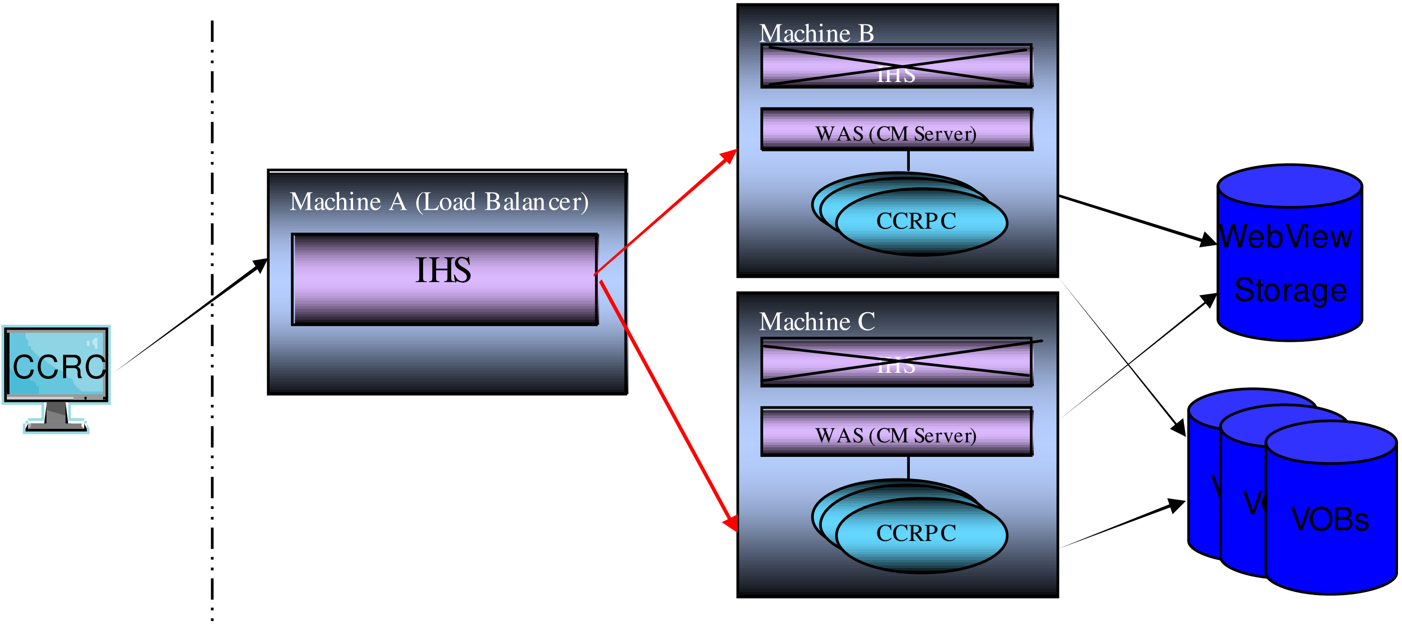
* Consolidating multiple sites with load balancing



- IHS will use a round-robin or random based load balancing approach in this configuration. If CQWeb/CM Server on Machine B is down, or if Machine B is down, ClearQuest web users logged to Machine B will be offloaded to Machine C.
  - For users that only have read sessions on Machine B, they won't notice anything.
  - If a user has a write session on Machine B and is in the middle of modifying a record, only non-committed data in that active session would impacted.

Centralized and Flexible deployment leveraging CM Server

* Consolidating multiple sites with load balancing



- IHS will use a round-robin load balancing approach with session affinity in this configuration.
- If both CM Servers are active, a new CCRC session will connect to the next available CM Server.
- If one of the servers is unavailable, CCRC users will be directed to the available CM Server.
- Both servers can access the same views located at a central storage location specified with CM Server MBEANs
  - ccrcViewStorage (UNC path name to storage location)
  - ccrcUseViewHostPathForGlobalPath (set to TRUE)

Centralized and Flexible deployment leveraging CM Server
* Use region mapping

- Customize/configure VOB access based on user identity
  - A user region map allows mapping of OS users and groups to ClearCase regions.
  - A user region map can be used to restrict or allow a user or a group access to a set of VOBs grouped by region.
  - A user region map is a flat file located on the CM Server. The pathname of this file is specified as a value for the MBEAN attribute “***ccrcUserRegionMapfile”.***

Centralized and Flexible deployment leveraging CM Server

* Use region mapping (an example)

- ClearCase example
  - CM Server configured with “region1” and “region2”. Either of them can be the default region.
  - “region1” contains vob1_1 and vob1_2.
  - “region2” contains vob2_1 and vob2_2.
  - Sample region mapping file

    region1 = {CMBUQE\userA }

    region2 = {CMBUQE\userB }

    – * Note: There must be a space before the final ‘}’
  - “userA” has access to vob1_1 and vob1_2 only.
  - “userB” has access to vob2_1 and vob2_2 only.

Centralized and Flexible deployment leveraging CM Server

* Use region mapping (an example)

- ClearCase/ClearQuest integration
  - Deployment configuration
    - CQ Web can be used to access multiple CC regions from a single CM Server.
    - Previous versions (v6.x and v7.0.x) allowed access only to the default CC region for the CQ Web Server.
  - Relevant use cases
    - View UCM Changeset
    - Change Headline
  - Scenario
    - User A works in CC region A
    - User B works in CC region B
    - Both users access CQ Web via http://SharedServer1/cqweb
    - User A views changeset in CQ Record A which is bound to UCM Activity in region A
    - User B views changeset in CQ Record B which is bound to UCM Activity in region B

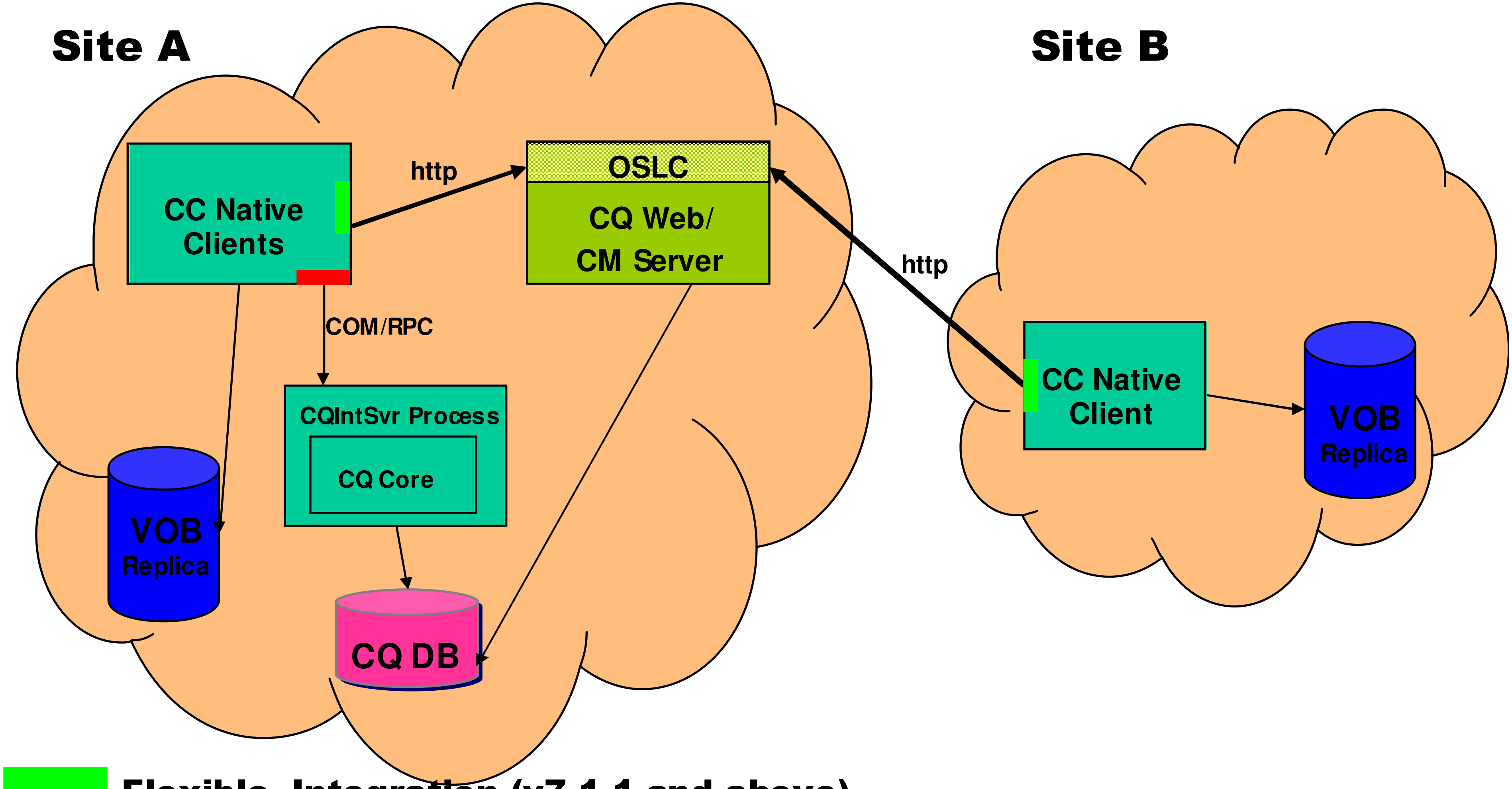
Centralized and Flexible deployment leveraging CM Server

* New CC-CQ integration option for more flexible deployment

- **Enable LAN ClearCase to communicate with WAN ClearQuest for UCM**
  - In 7.1.1 release, only ClearCase thick clients provide this support
    - Ex. Cleartool, Project Explorer, ClearCase Explorer, etc.
  - It has no impact to UCM use cases through CCRC or CQWeb
    - Plan to extend to CCRC and CQWeb
- **Uses OSLC CQ REST API**
  - Installed with 7.1.1 CQ Web
  - WAN-friendly calls over HTTP(s)
- **Advantages**
  - Removes need to deploy CQ thick clients
  - Removes dependency on CQ Multisite
  - New functionality is available on platforms not supported by ClearQuest
    - Solaris X86, Linux 390, Linux PPC, HP IA64
- See technote **#1398642** for detailed information.

Centralized and Flexible deployment leveraging CM Server

* New CC-CQ integration option for more flexible deployment



🟩 **Flexible Integration (v7.1.1 and above)**

🟥 **Native Integration**

Summary

- It is highly recommended to enable WAS administrative security for the 7.1.x CM Server (for CCRC and for ClearQuest Web).

- It is highly recommended to configure IBM Secure Socket Layer (SSL) protocol for secure communication with ClearCase Remote Client (CCRC) and ClearQuest Web. Additional security can be implemented using proxy servers.

- CM Server provides many features, options and benefits that can be leveraged to achieve a flexible, centralized deployment model for enterprise and global environments.

Questions

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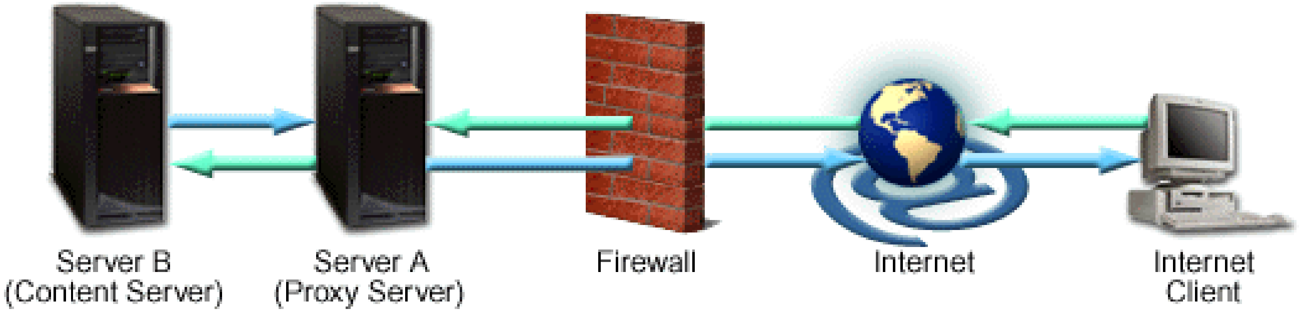
Backup slides: Forward Proxy and Reverse Proxy

- Reverse Proxy



- Forward Proxy