



QAD Enterprise Applications
Enterprise Edition

Training Guide Installation and Administration

70-2979B
QAD 2010 Enterprise Edition
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About This Course

Course Description

This course is designed to build your expertise in installing, configuring, and maintaining QAD Enterprise Edition. It consists of five modules:

- Installation
- Administration and Configuration
- Security, Reporting, and Daemons
- Validation and Troubleshooting
- Database Administration

Course Objectives

By the end of this class, students will:

- Install and configure QAD Enterprise Edition
- Validate the new installation
- Set up security
- Set up reporting and configure custom reports
- Troubleshoot and solve common installation and configuration issues
- Administer and tune the QAD EE Progress database.

Audience

This course is intended for system administrators and other technical users who will be installing, configuring, and maintaining QAD Enterprise Edition products.

Prerequisites

This course requires experience in database administration and familiarity with QAD products.

System Requirements

This course uses the QAD Enterprise Applications Enterprise Edition database. Whether you are studying this material in a classroom or as a self-study exercise, this is launched in a virtual environment management system. QAD instructors will prepare classroom environments. If you encounter questions or problems on QAD software that are not addressed in this book, several resources are available.

QAD Resources

If you encounter questions or problems on QAD software that are not addressed in this book, several resources are available.

Product Help

All QAD products ship with integrated help systems. A properly installed QAD application will display help when you press the Help key (F1), or access it through the menu. The help covers the normal use of the product.

QAD Web Resources

The QAD website provides product and company overviews. The Print Solution option on the opening page provides a means of compiling desired content into a document specialized to your industry, business implementation, and needs.

<http://www.qad.com/>

From QAD's main site, you can access QAD's Learning or Support sites.

QAD Learning Portal for Training Opportunities

To view available training courses, locations, and materials, use the QAD Learning Portal. Choose Learning under the Global Services tab to access this resource.

QAD Support for Product Documentation and the QAD Knowledgebase

To access release notes, user guides, installation and conversion guides by product and release, visit the Support website. Support also offers an array of tools depending on your company's maintenance agreement with QAD. These include the Knowledgebase and direct links to QAD Support experts.

Choose Support under the Global Services tab.

Any QAD customer can register for a QAD web account by accessing the Support web site and clicking the Accounts link at the top of the screen. Your customer ID number is required. Access to certain areas is dependent on the type of agreement you have with QAD.

Chapter 1

Installation

Learning Objectives



Learning Objectives

- ▲ This training material is part of the QAD Foundation Certification initiative
- ▲ The participant should, after this course, be able to
 - Understand and use the QDT tool
 - Install OpenEdge relational database software
 - Install QAD Enterprise Edition
 - Understand how to apply software patches
 - Be able to add new users and printers to the system

QAD Proprietary

Agenda - Overview



Agenda - Overview

- ▲ Introduction to QAD Enterprise Edition

- ▲ Introduction to the QAD Deployment Tool (QDT)
 - Installation and Usage

- ▲ Overview of QAD Enterprise Edition installation
 - Considerations
 - Installation
 - Users and Printers
 - Patch management

QAD Proprietary

This presentation describes the QAD Deployment Toolkit (QDT) and how to use it to install QAD products.

QAD Enterprise Edition



QAD Enterprise Edition

- ▲ QAD Enterprise Edition is a complete enterprise solution that provides QAD core
 - Foundation manufacturing, distribution, financials modules.
 - Sometimes known as Enterprise Resource Planning (ERP)
- ▲ QAD Enterprise Edition also includes
 - Extensible data and security management features allowing for plug-ins to QAD's additional solutions
- ▲ In the past, the ERP component was known as MFG/PRO and carried the brands known as eB, eB2, eB2.1, and QAD 2007

QAD Proprietary

Key Features



QAD Enterprise Edition – Key Features

▲ Enterprise Financials

- Completely revamped financials functionality
- Support for small to global organizations
- Support for multiple languages, currencies, technical character sets and tax systems
- Extended budgeting and cost accounting
 - Cost Control
 - Allocation
 - Split view on organizational, departmental and activity levels
- Service-Oriented Architecture (SOA)

QAD Proprietary

Key Features 2



QAD Enterprise Edition – Key Features

▲ Ease of use

- Intuitive interface
- Flexible workflows and automation

▲ Scalability

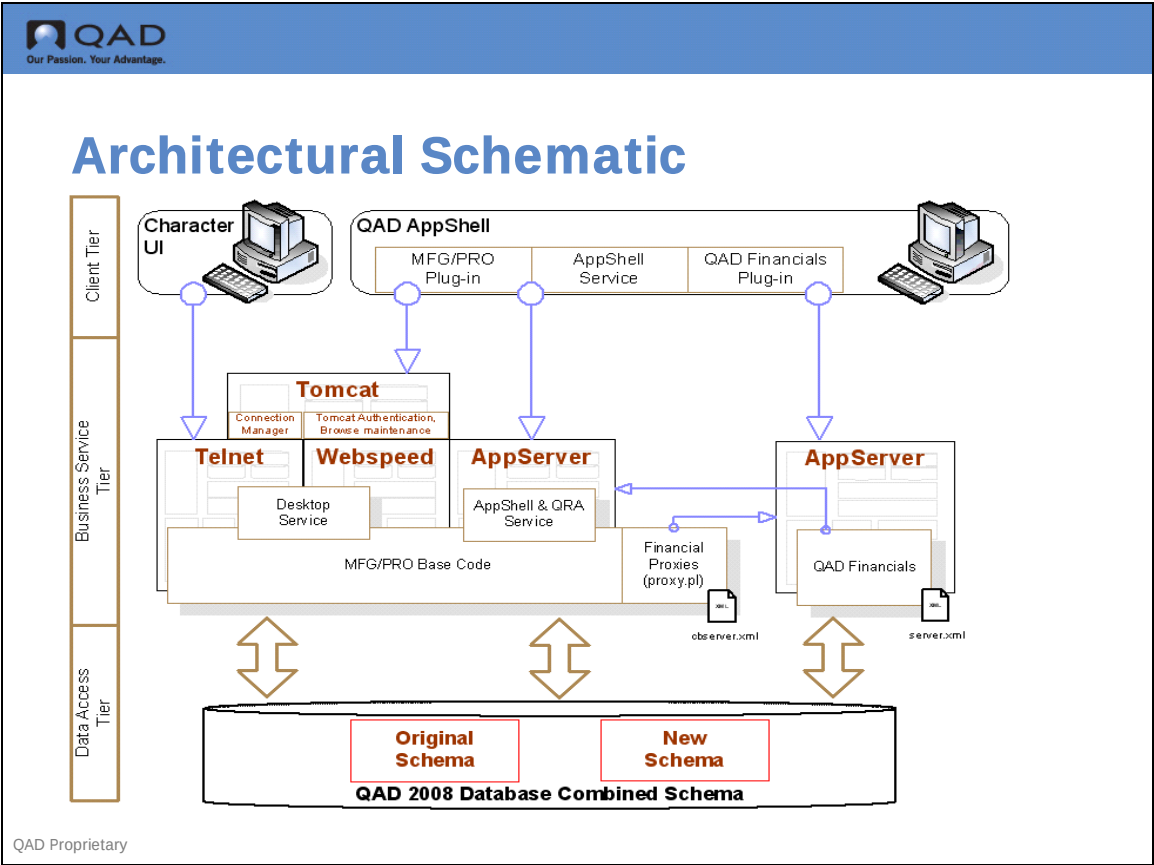
- Tested at the HP labs in Silicon Valley to 2000 users without performance degradation

▲ Governance, risk, and compliance

- Roles-based security
- Legal requirements by country and/or industry

QAD Proprietary

Architectural Schematic



Key Architecture Features



Key Architecture Features

- ▲ QAD Deployment Toolkit (QDT)
 - Enhanced and Streamlined install / deploy tool
- ▲ Business Logic Foundation (BLF)
 - New architectural design for Enterprise Financials
 - Non intrusive customizations based on standard code templates
 - Enhanced debugging
 - “Stateless” Appserver components
 - Programs supplied in library files (.pl) instead of encrypted source
- ▲ Appserver integration between legacy and new financials programs

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Enterprise Versus Standard Edition



Enterprise Versus Standard Edition

- ▲ QAD Standard Edition is an incremental improvement from the QAD 2007 release
- ▲ QAD Standard Edition does not contain the new Enterprise Financials software components

QAD Proprietary

Introducing QDT



Next : Introducing the QDT

QAD DEPLOYMENT TOOLKIT (QDT)



QAD Proprietary

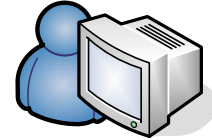
QAD Deployment Toolkit (QDT)



What is QDT?



What is QDT?



QDT

- ▲ Installer for QAD products
- ▲ Independent from QAD Enterprise Applications
- ▲ Reads product information from CD
- ▲ Product CD contains installation workflow
- ▲ Manages installation and administration
- ▲ During installation auto-detects prerequisites
- ▲ Maintains full environment information

QAD Proprietary

Installation Overview



Installation Overview

- ▲ Preparation and prerequisites
- ▲ Install QDT
- ▲ Install QAD Enterprise Edition
 - Character interface
 - Appshell (.NET user interface)
 - Configure the QAD Connection Manager
- ▲ Install clients

QAD Proprietary

QDT Detail



QDT in a little more detail...

- ▲ User installs QDT
- ▲ User launches QDT
- ▲ QDT reads product image
- ▲ Presents user with product selection
- ▲ Install selected components of QAD product
 - Reads product configuration (*'ini files'*) and create environment XML (*'the XML'*)
 - Uses XML to drive the installation
- ▲ User configures the components
 - Uses XML to drive the configuration process
- ▲ QAD product ready

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QDT XML Representation


Our Passion. Your Advantage.

QDT XML Representation – ‘the XML’

- ▲ System details →
- ▲ Product containers →
- ▲ Component containers →
- ▲ Action containers →
- ▲ Config properties →
- ▲ Located:
`<qdt-install>/xml/QDT<host>.xml`

```

<?xml version="1.0"?>
<qdtConfig xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <host name="MXB-LT3">
    <container name="system" type="env">
      <description>QAD Deployment Toolkit</description>
      <version>1.0</version>
      <destination>C:/QDT</destination>
      <javaHome>C:\Program Files\Java\jre1.5.0_07</javaHome>
      <opSys>Win32</opSys>
      <progressInstallDir>C:\Progress\OpenEdge</progressInstallDir>
      <userID>mxsb</userID>
    </container>
    <container name="prod-eb3" type="product">
      <description>MFG/PRO</description>
      <version>eB3</version>
      <container name="dbserver" type="dbserver">
        <description>MFG/PRO eB3 Database Server</description>
        <destination>c:\eB3\db</destination>
        <container name="dbserver-create" type="action">
          <description>Configure Database Sets</description>
          <operationType>create</operationType>
          <passToChildren>true</passToChildren>
          <status></status>
        </container>
        <container name="prod-set" type="dbset">
          <description>Production Database Set</description>
          <container name="prod-qddb" type="db">
            <description>Production Main Database</description>
            <dataLoadLangs>us</dataLoadLangs>
            <dataLoadPath>c:\eB3\db\mfg</dataLoadPath>
            <logicalName>qddb</logicalName>
            <oidGenCode>9000</oidGenCode>
            <path>c:\eB3\db</path>
            <physicalName>mfgprod</physicalName>
            <serverParms>-L 20000 -c 350 -B 1000</serverParms>
            <servicePort></servicePort>
            <sourceDB>empty-qddb</sourceDB>
            <structureFile>c:\eB3\db\mfgprod.st</structureFile>
            <container name="prod-qddb-create" type="action">
              <description>Create production qddb database</description>
              <configIni>createdb.ini</configIni>
              <operationType>create</operationType>
              <passToChildren>false</passToChildren>
              <status></status>
            </container>
          </container>
        </container>
      </container>
    </container>
  </host>
</qdtConfig>

```

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Default Installation Walkthrough



System Prerequisites



System Prerequisites

- ▲ Supported OpenEdge version installed and working
 - Enterprise Database
 - 4GL development
 - Enterprise Application Server
 - *AdminServer and Nameerver started and are running*
- ▲ Tomcat 5.5.15+
- ▲ Java J2SE 5.0+
- ▲ Setup environment variables
 - \$DLC, \$TOMCAT_HOME, \$CATALINA_HOME, \$TOMCAT_HOME, \$JAVA_HOME
 - Add variables to PATH
- ▲ QAD Enterprise Edition License Codes
- ▲ Telnet users created on the server for AppShell
 - Windows installs also require Georgia Softworks Telnet Server

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QDT Default Values



QDT Default Values

- ▲ All default values can be modified

- ▲ Progress Install: \$DLC or Registry in Windows
- ▲ Progress AdminServer - Port: 20931
- ▲ Progress NameServer - Name: NS1 Port: 5162
- ▲ Progress 32bit/64bit: Auto-detected by QDT
- ▲ Java Install: \$JAVA_HOME
- ▲ Tomcat Install: \$TOMCAT_HOME \$CATALINA_HOME
- ▲ Tomcat Port: 8080
- ▲ Language: US

QAD Proprietary

Start Admin Server and Tomcat



Start Admin Server and Tomcat

```

172.16.29.12 - PuTTY
/mnt/iso/install
bash-3.00# proadsv -query
OpenEdge Release 10.1C03 as of Sat Jan 31 21:39:28 EST 2009
AdminServer is alive. (8545)
bash-3.00# nsman -i NS1 -q
OpenEdge Release 10.1C03 as of Sat Jan 31 21:39:28 EST 2009

Connecting to Progress AdminServer using rmi://localhost:20931/Chimera (8280)
Searching for NS1 (8288)
Connecting to NS1 (8276)

NameServer NS1 running on Host qadrh.qad.com Port 5162 Timeout 30 seconds.
There are no registered Application Services for this NameServer
bash-3.00# ps -ef | grep tomcat
0      11782      1  0 10:19 pts/1    00:00:17 /usr/java/jdk1.5/bin/java -Djava
.util.logging.config.file=/dr01/tomcat/conf/logging.properties -Djava.util.loggi
ng.manager=org.apache.juli.ClassLoaderLogManager -Djava.awt.headless=true -serve
r -Xms256m -Xmx256m -Dfile.encoding=utf-8 -Djava.endorsed.dirs=/dr01/tomcat/comm
on/endorsed -classpath :/dr01/tomcat/bin/bootstrap.jar:/dr01/tomcat/bin/commons-
logging-api.jar -Dcatalina.base=/dr01/tomcat -Dcatalina.home=/dr01/tomcat -Djava
.io.tmpdir=/dr01/tomcat/temp org.apache.catalina.startup.Bootstrap start
0      13087  7447  0 10:51 pts/1    00:00:00 grep tomcat
bash-3.00# ./install.ksh

```

QAD Proprietary

Install QDT



Install QDT

172.16.29.12 - PuTTY

```
# pwd
/mnt/iso/install
# ./install.ksh
```

172.16.29.12 - PuTTY

```
To install QAD Deployment Toolkit (QDT),
you must accept this agreement. (y/n)?
Default is n
->y

Please enter the the directory in which to install QAD Deployment Toolkit (QDT).
Default is /usr/local/qdt
->/dr01/qadapps/qdt

Please enter the location where the installation log file should be written.
Default is /dr01/qadapps/qdt/logs
->
Directory /dr01/qadapps/qdt/logs does not exist.

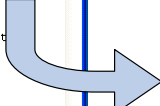
Create it (y/n)?
Default is y
->

Please enter the location where the QDT XML files should be written.
Default is /dr01/qadapps/qdt/xml
->
Directory /dr01/qadapps/qdt/xml does not exist.

Create it (y/n)?
Default is y
->
Making /dr01/qadapps/qdt/xml
```

- ▲ User Perl to Install
- ▲ Command line interface
- ▲ Run install/install.ksh or install.bat





```
Found component MFGUTIL
Found component QDT
Found component QDT_Resources
Found component QDT_Ini

Installation Summary:
QDT Install Directory ..... /dr01/qadapps/qdt
QDT Log Directory ..... /dr01/qadapps/qdt/logs
QDT XML Directory ..... /dr01/qadapps/qdt/xml
```

QAD Proprietary

Launch QDT

Launch QDT

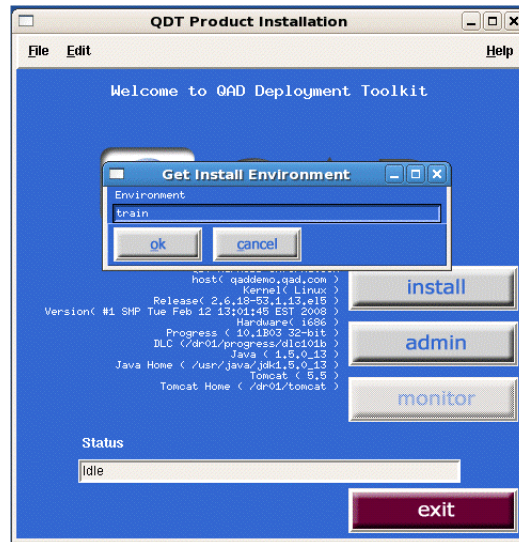
- ▲ Requires GUI to launch
- ▲ Uses Perl
- ▲ Auto detects environment configuration (see prerequisites)



QAD Proprietary

Install & Name Environment

- ▲ Validate auto-detected values
- ▲ Choose install
- ▲ Enter and environment name



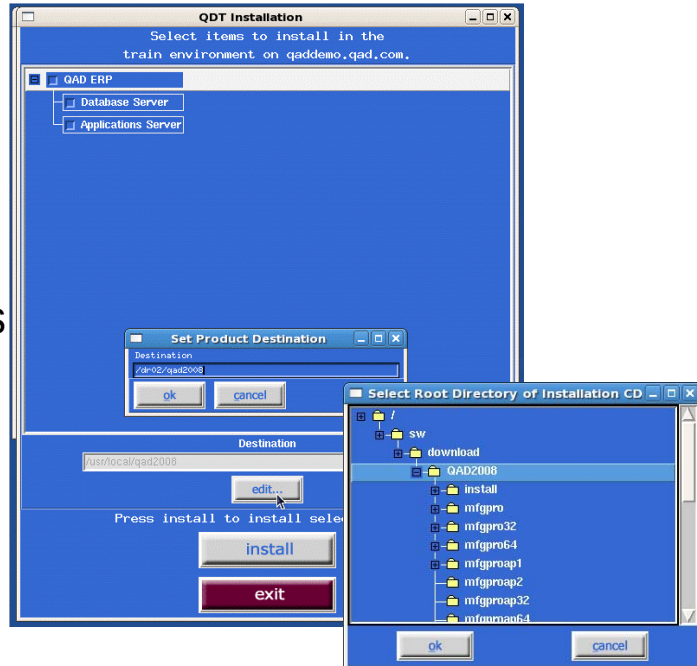
QAD Proprietary

Choose Products and Installation Folder



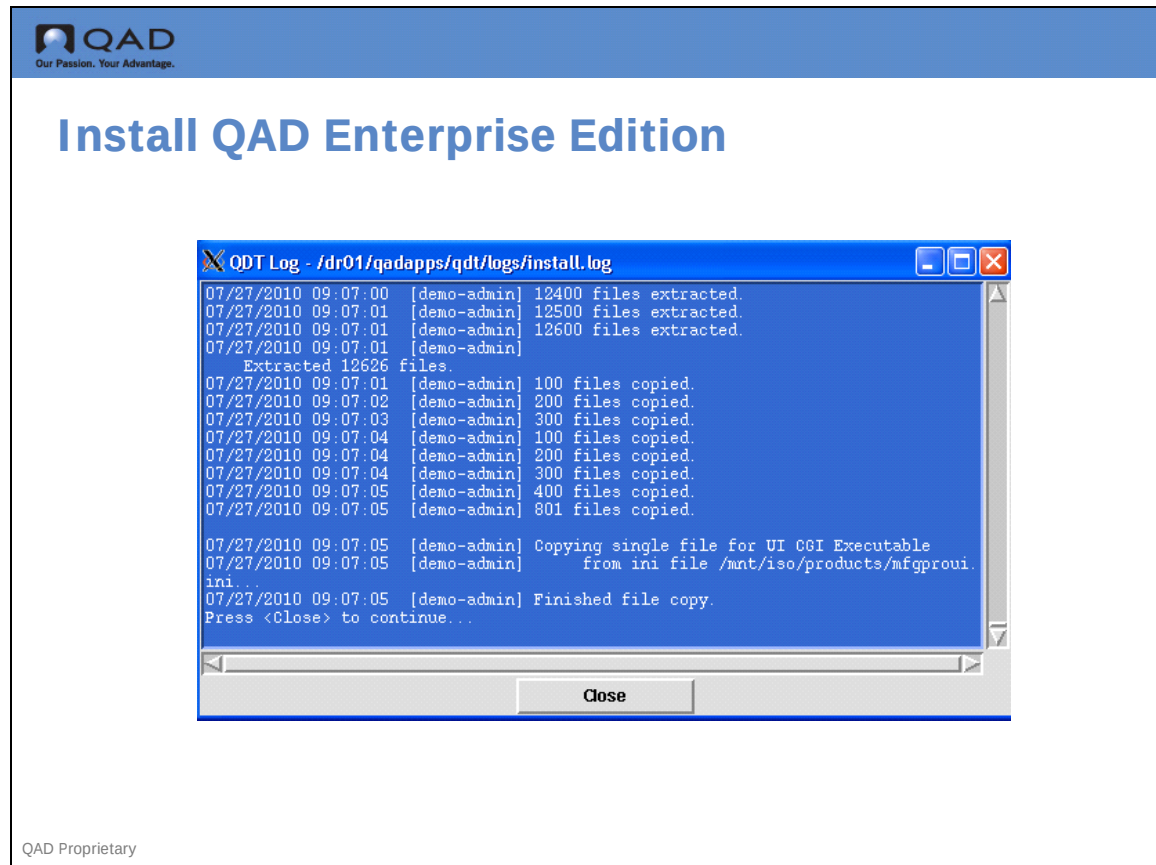
Choose products and installation folder

- ▲ Product detected from CD Image
- ▲ Select components
- ▲ Enter installation destination



QAD Proprietary

Install QAD Enterprise Edition



QDT Admin Navigation



Our Passion. Your Advantage.

QDT Admin Navigation

Choose Admin to configure the installed products
(compile, create db's, scripts, etc)

File Database Conversions Programs Help

Product

> QAD train Environment
QAD ERP
Database Server
Applications Server

Action

> Configure QAD ERP
Convert QAD ERP From Previous Release
Synchronize QAD ERP
Start QAD ERP
Stop QAD ERP

Steps In Action Set

RP: Config
abase Serv
empty Datab
Empty Mail
Empty Sing
Empty Adm
Empty Help
AD ERP Dat
Live Main
Live Admin
Live Help
AD ERP Dat
[] Pause

Product/Component Selection

Cursor to move up and down

Return to select

Tab to move to Actions

Actions available for a Product/Component Selected

Cursor to move up and down

Return to select

Tab to move to Steps in Action

QAD Proprietary

QDT Admin Navigation 2

QAD
Our Passion. Your Advantage.

QDT Admin Navigation

File Database Conversions Programs Help

Product	Action
QAD train Environment > QAD ERP Database Server Applications Server	> Configure QAD ERP Convert QAD ERP From Previous Release Synchronize QAD ERP Start QAD ERP Stop QAD ERP

Steps In Action Set

> QAD ERP: Configure QAD ERP
 Database Server: Configure QAD ERP Database Sets
 Empty Database Set: Create QAD ERP Empty Database Set
 Empty Main Database: Create Empty Main Database
 Empty Single R-code Database: Create Empty Single R-code Database
 Empty Admin Database: Create Empty Admin Database
 Empty Help Database: Create Empty Help Database
 QAD ERP Database Set: Create QAD ERP Database Set
 Live Main Database: Create Live Main Database
 Live Admin Database: Create Live Admin Database
 Live Help Database: Create Live Help Database
 QAD ERP Database Set: Create Live Database Scripts

[] Pause Before Executing Each Action

<Edit... > **Execute** < Cancel >

Steps In Action (Workflow)
Cursor to move up and down
Tab to move to Edit & Execute

Pause between steps
Allows for stopping and re-starting

QAD Proprietary

QDT Admin Navigation 3

QAD
Our Passion. Your Advantage.

QDT Admin Navigation

File Database Conversions Programs Help

Product	Action
QAD train Environment > QAD ERP Database Server Applications Server	> Configure QAD ERP Convert QAD ERP From Previous Release Synchronize QAD ERP Start QAD ERP Stop QAD ERP

Steps In Action Set

> QAD ERP: Configure QAD ERP
 Database Server: Configure QAD ERP Dat
 Empty Database Set: Create QAD ERP E
 Empty Main Database: Create Empty
 Empty Single R-code Database: Create Emp
 Empty Admin Database: Create Empty Admin
 Empty Help Database: Create Empty Help Dat
 QAD ERP Database Set: Create QAD ERP Databas
 Live Main Database: Create Live Main Databa
 Live Admin Database: Create Live Admin Datab
 Live Help Database: Create Live Help Databas
 ERP Database Set: Create Live Database Scri

[] Use Before Executing Each Action

<Edit... > **Execute** < Cancel >

Execute Steps in Action Set
Run through all steps

Edit Step in Action
Allow configuration of steps. i.e. change database startup params

QAD Proprietary

Edit Step in Action Set

QAD Admin – Edit Step in Action Set

File Database Conversions Programs Help

Product

- QAD train Environment
- > QAD ERP
 - Database Server
 - Applications Server

Action

- > Configure QAD ERP
- Convert QAD ERP From Previous Release
- Synchronize QAD ERP
- Start QAD ERP
- Stop QAD ERP

Compiler Settings

Container: ☐ Staggered QAD ERP Default
☐ Flat Destination
☐ Destination Same as Source

Compile Set File: /dr02/qad2008/utd
☐ Generate New

Compile Propath: /dr02/qad2008/xr
 dfin,/dr02/qad2008

Database Set: Empty Database Set

Destination Dir: /dr02/qad2008 <Browse>

☐ Multi-Thread Files Per Thread: 4000
☐ Ignore Compile Errors

< Back > **Next** > Done >> Cancel >

Annotations:

- Tab to move between fields
- Space bar to select toggle boxes
- Cursor up/down to select radio buttons
- Next: move to next action Edit
- Done / Cancel to Return to Action Set List

QAD Proprietary

Configure Product Components

QAD
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Configure Product Components

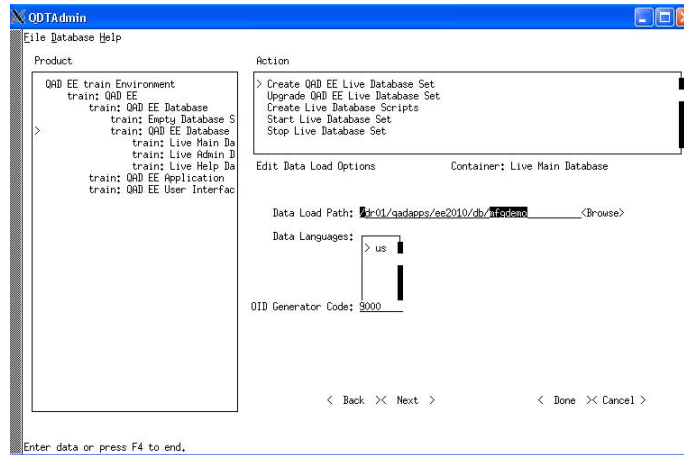
- ▲ Choose Admin to configure the installed products (compile, create db's, scripts, etc)
- ▲ Select Edit to change default configuration

QAD Proprietary

Configure Product Components 2



Configure Product Components



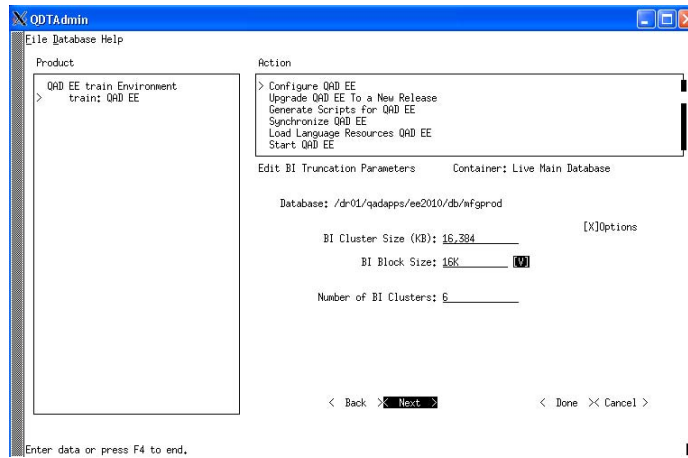
- ▲ Change default Data Load to mfg or mfgdemo (for QAD demo Database)

QAD Proprietary

Configure Product Components 3



Configure Product Components



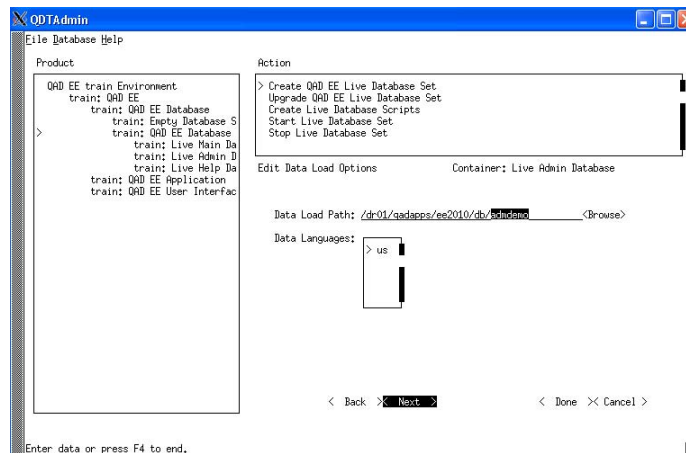
- ▲ Change default Database BI Size by selecting Options

QAD Proprietary

Configure Product Components 4



Configure Product Components



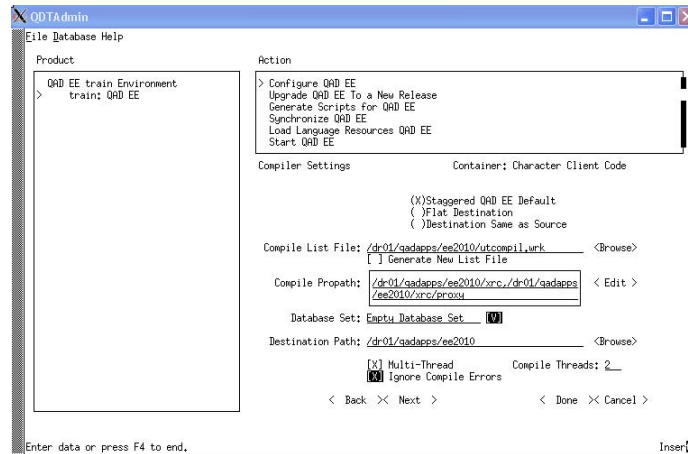
- ▲ Change default Data Load to admin or admdemo (for QAD demo database)

QAD Proprietary

Configure Product Components 5



Configure Product Components



- ▲ Multi-Thread should be selected if server has two or more cores. “Compile Threads” should match the number of cores that server has. Select Ignore Compile Errors.

QAD Proprietary

Configure Product Components 6



Configure Product Components

The screenshot shows the QADAdmin application window with the following sections:

- Product:** QAD EE train Environment, train: QAD EE
- Action:**
 - > Configure QAD EE
 - Upgrade QAD EE To a New Release
 - Generate Scripts for QAD EE
 - Synchronize QAD EE
 - Load Language Resources QAD EE
 - Start QAD EE
- AppServer UBroker Properties:** Container: Financials AppServer
 - NameServer: NSI Mode: Stateless
 - AppServer Name: gadfintrain Port #: 53810
 - Description: Financials AppServer
 - Log Directory: /dr01/gadapps/gdt/logs <Browse>
 - Work Directory: /dr01/gadapps/ee2010/fin <Browse>
 - ☐ SSL Enabled
- Server Properties:**
 - Instances -- Min: 2 Max: 8 Initial: 2
 - Ports -- Min: 52011 Max: 52020
 - Start Parameters: -rereadnolock -s 512 -max 16000 -inp 32000 -tok 200
 - Propath: /dr01/gadapps/gdt/envs/train/configs/dr01/gadapps/ee2010/fin/gxtend/dr01/gadapps/ee2 <Edit>

Navigation buttons: < Back > Next > Done > Cancel >

Footer: Enter data or press F4 to end.

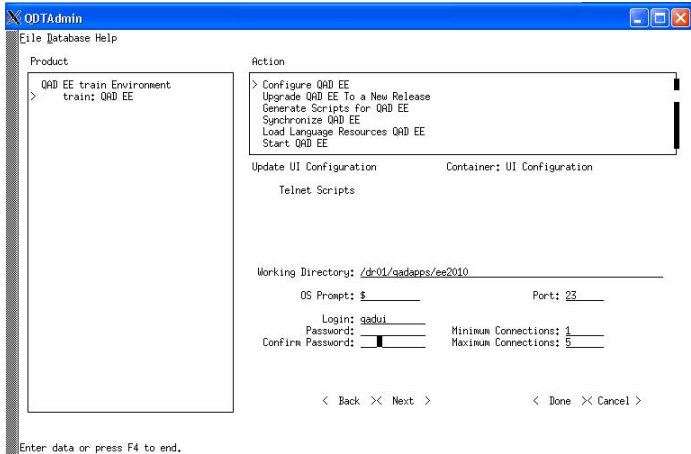
▲ Validate Port for AppServer and WebSpeed Broker

QAD Proprietary

Configure Product Components 7

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Configure Product Components



▲ Set Connection Manager Password: tab into steps and scroll to Update UI Configuration

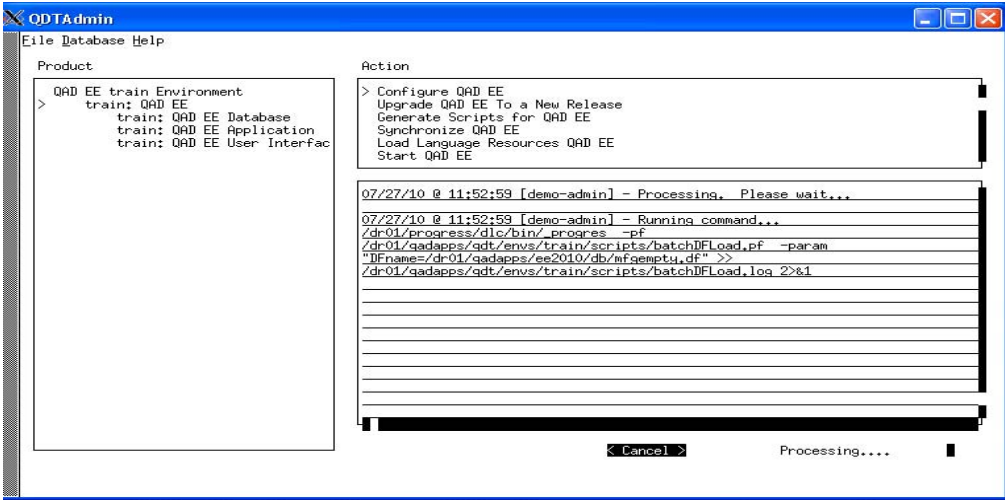
QAD Proprietary

Configure Product Components 8



Our Passion. Your Advantage.

Configure Product Components



The screenshot shows the QADAdmin application window. On the left, under the 'Product' tab, a tree view shows 'QAD EE train Environment' expanded, with sub-items: 'train: QAD EE', 'train: QAD EE Database', 'train: QAD EE Application', and 'train: QAD EE User Interface'. The 'Action' tab on the right shows a list of actions: 'Configure QAD EE', 'Upgrade QAD EE To a New Release', 'Generate Scripts for QAD EE', 'Synchronize QAD EE', 'Load Language Resources QAD EE', and 'Start QAD EE'. Below this, a command prompt window displays the execution of a script: '07/27/10 @ 11:52:59 [demo-admin] - Processing. Please wait...', '07/27/10 @ 11:52:59 [demo-admin] - Running command...', and the command: 'Zdr01/process/qdc/bin/_Proces -pf /dr01/qadapps/qdt/envs/train/scripts/batchJIFLoad.pf -param "DfName=/dr01/qadapps/ee2010/db/mfempty.df" >> /dr01/qadapps/qdt/envs/train/scripts/batchJIFLoad.log 2>&1'. At the bottom of the window, there is a 'Cancel' button and a 'Processing....' status indicator.

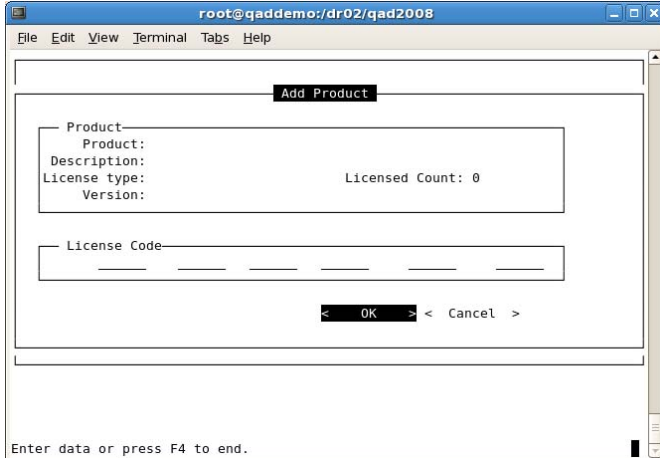
▲ Click Execute to start the process

QAD Proprietary

License Product



License Product



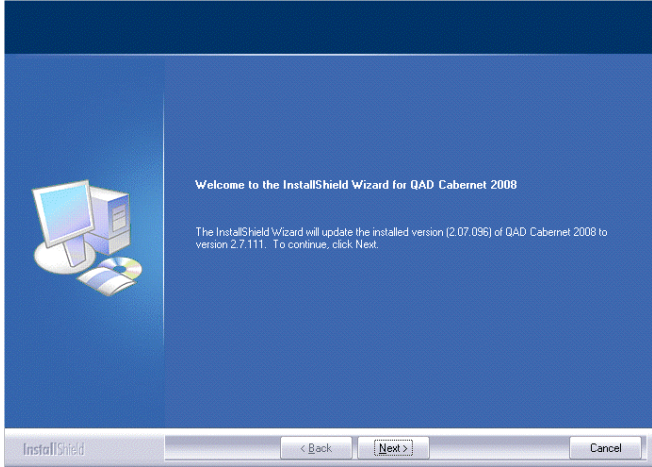
- ▲ Launch CHUI using
 <QAD Installdir>/client-<lang>.<env>
- ▲ Enter license codes

QAD Proprietary

Install the AppShell



Install the AppShell



- ▲ One the client machine point to `http://<install-server-host>:<port>/qadhome`
- ▲ Follow onscreen installation steps

QAD Proprietary



Launch the AppShell



Launch the AppShell



- ▲ Launch the AppShell from the icon on the desktop

QAD Proprietary

Initialize Connection Manager



Initialize Connection Manager

- ▲ From within the AppShell
 - Launch Connection Manager
 - Choose 'Restart Connection Manager'

Connection Manager ✕

Functions ⌕

Close Connection Manager
 Restart Connection Manager
 Reset failed init count
 Delete HTML cache
 Message of the day
 Update configuration settings

Connections ⌕

All
 Busy
 Idle
 Initializing

Connection Manager - Default/Desktop

Sun Apr 19 20:06:21 PDT 2009
All: 8 Busy: 0 Idle: 8 Initializing: 0

Name: All

Status	ID	Process ID	User ID	Device	User IP	Maximum Connections	Program	User Connected Time
Idle	1132	0	null		null	0	null	
Idle	1133	0	null		null	0	null	
Idle	1134	0	null		null	0	null	
Idle	1135	0	null		null	0	null	

QAD Proprietary

Starting and Stopping QAD Enterprise Edition



Starting and Stopping QAD Enterprise Edition

▲ Startup sequence:

- Databases
 - <install-dir>/db/start.<env>
- Progress AdminServer (change –start to -query to check):
 - \$DLC/bin/proadsv –start
- QAD UI AppServer:
 - \$DLC/bin/asbman –n qadui_AS<env> -start
- QAD Financials AppSever:
 - \$DLC/bin/asbman –n qadfin<env> -start
- WebSpeed Server:
 - \$DLC/bin/wtbman –n qadui_WS<env> -start
- Tomcat Server:
 - \$TOMCAT_HOME/bin/startup.sh

QAD Proprietary

Starting and Stopping QAD Enterprise Edition 2



Starting and Stopping QAD Enterprise Edition

▲ Shutdown sequence:

- Tomcat Server:
 - \$TOMCAT_HOME/bin/shutdown.sh
- Progress AdminServer (Optional – this will close all environments):
 - \$DLC/bin/proadsv –stop
- WebSpeed Server*:
 - \$DLC/bin/wtbman –n qadui_WS<env> -stop
- QAD Financials AppSever*:
 - \$DLC/bin/asbman –n qadfin<env> -stop
- QAD UI AppServer*:
 - \$DLC/bin/asbman –n qadui_AS<env> -stop
- Databases
 - <install-dir>/db/stop.<env>

QAD Proprietary

*** Not required if AdminServer Closed**

Starting and Stopping QAD Enterprise Edition 3


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Starting and Stopping QAD Enterprise Edition

File Database Conversions Programs Help

Product	Action
QAD train Environment	Configure QAD ERP
> QAD ERP	Convert QAD ERP From Previous Release
	Synchronize QAD ERP
	> Start QAD ERP
	Stop QAD ERP

- ▲ QDT will start and stop databases, appservers and WebSpeed
- ▲ Need AdminServer running before starting
- ▲ Need to start Tomcat after starting
- ▲ Reverse this for stopping

QAD Proprietary



Patches



Next : Patch Installation

PATCHES



QAD Proprietary

Enterprise Edition and Patches



QAD and Patches

- ▲ QAD is constantly improving the QAD Enterprise Edition product, and will release patches to address issues as they occur.
 - After installing QAD Enterprise Edition, you should check to see if patches need to be applied

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Installing a Patch



Installing a Patch

- ▲ After a patch has been copied to your system
 - Unzip the patch
 - Change to the install directory
 - Start the installation script

```
[root@linux-tst install]# pwd
/sw/download/qad2008_patch13/patch57.1.12/install
[root@linux-tst install]# ./instpatch.ksh
```

QAD Proprietary

Installing a Patch 2



Installing a Patch

- ▲ Accept the License agreement
- ▲ Provide requested path information
 - Usually Open Edge and Tomcat directories

```
Do you accept all the terms of the preceding License Agreement?
If you choose no, the install will stop.

To install QAD 2008.1 EE Financials Patch,
you must accept this agreement. (y/n)?
Default is n
->y

Please enter the location where to install QAD 2008.1 EE Financials Patch.
Default is /usr/local/qad2008
->/sw/qad2008

Please enter the location where the installation log file should be written.
Default is /sw/qad2008/logs
->

Please enter the location where the Progress Installation Directory can be found
.
Default is /sw/dlc101c
->

Please enter the location where the Tomcat Directory can be found.
Default is /sw/tomcat/5523
->
```

QAD Proprietary

Unicode



Next : Unicode Considerations

UNICODE



QAD Proprietary

Unicode 3



Unicode – what is it all about

- ▲ Allows you to store data from a number of different code pages in a single database
- ▲ Sorted linguistically
- ▲ QAD .NET UI is Unicode end to end
- ▲ Progress supports Unicode with utf-8



QAD Proprietary

Unicode 4



Unicode - Optional or Mandatory?

- ▲ Unicode is optional
 - But mandatory if you want different code pages in the same database (That is what Unicode is for)
 - Example you can do French & German today in an iso8859-1 database, but if you French and Czech in the same db you need Unicode
- ▲ The database is 21-23% bigger
 - Mainly because index keys are bigger
 - Largest index key today is 188 bytes (in 10.1B this Progress limit will be increased). Tested a number of databases and have not hit this limit.
- ▲ Performance / Benchmarks
 - UI performance is about the same (user's subjective viewpoint)
 - Complex processes like MRP can run about 20% slower

QAD Proprietary

Unicode 5



Unicode - Considerations

- ▲ Limited Character (CHUI) support
 - No Support on Windows!
 - Cannot swap QAD Domains
 - Don't dump and reload the database using CHUI
- ▲ Try to use Romanized characters (a-Z, 0-9) in key fields
 - This enables users of any language able to search for critical data

QAD Proprietary

Languages



Next : Not everyone speaks English

LANGUAGES



QAD Proprietary

Using Multiple Languages



Using Multiple Languages

- ▲ A single QAD database can be set up with multiple domains
 - Each domain can have its own language
 - Unicode allows multiple code pages to be supported at the database level
 - Some languages can operate within the same code page, others cannot
 - English / Chinese is ok, but Japanese / Chinese is not
- ▲ The QAD programs (r-code and libraries) support multiple languages
 - Separate compiles are not required

QAD Proprietary

Languages Installation Overview



Languages Installation Overview

- ▲ Core languages released with QAD base media
- ▲ Language Updates are bundled on individual CDs / media
- ▲ The QAD .NET User Interface must be updated after a new language install

QAD Proprietary

Using Multiple Languages



Using Multiple Languages

- ▲ Each user assigned a default language
- ▲ When logging in via the .NET UI
 - User can access any domain in a Unicode database regardless of their default language
 - The .NET UI clients are fully Unicode compliant
- ▲ When logging in via Character UI
 - User must log into a domain with a code page compatible with their default language

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Enterprise Edition and Multiple Languages



Enterprise Edition and Multiple Languages

- ▲ All labels, menus, messages and field level help are stored dynamically in the QAD databases
 - For each installed language, there will be a complete set of the above data for that language
- ▲ Some customer specific data such as order comments, accounts, sub accounts etc. can be assigned language translations
 - Described in the QAD Financials User Guide

QAD Proprietary

Implementing Multiple Languages



Implementing Multiple Languages

- ▲ QAD supplies a base/system language
 - This cannot be changed
- ▲ Language Maintenance Activities (36.4.1) are defined in the QAD Financials User Guide
 - Load the appropriate language data
 - Create countries for users (country create)
 - ISO display defaults
 - Assign each user a language and country code

QAD Proprietary

Printers



Next : Printing

INTRODUCTION TO PRINTERS



QAD Proprietary

Introduction to Printers



Introduction to Printers

- ▲ Reports, Inquiries and Browsers can all be sent to a variety of printers
 - Local and Network/System
- ▲ System printers should be defined within QAD
 - A physical printer must be accessible from the server
 - Define printer types in Printer Type Maintenance
 - Add individual printers in Printer Setup Maintenance
 - Set the default printers for users and/or menu selections in Printer Default Maintenance
 - Can default to terminal / page / window if you want to save paper

QAD Proprietary

Administration and Configuration

Agenda - Overview



Agenda - Overview

- ▲ Technical Administration and Configuration Tasks within QAD Enterprise Edition
 - .NET UI Administration
 - Connection Manager
 - Startup and Shutdown Sequence
 - Multiple Tomcat Webapp servers
 - Multiple QAD Environments

QAD Proprietary

QAD Enterprise Edition

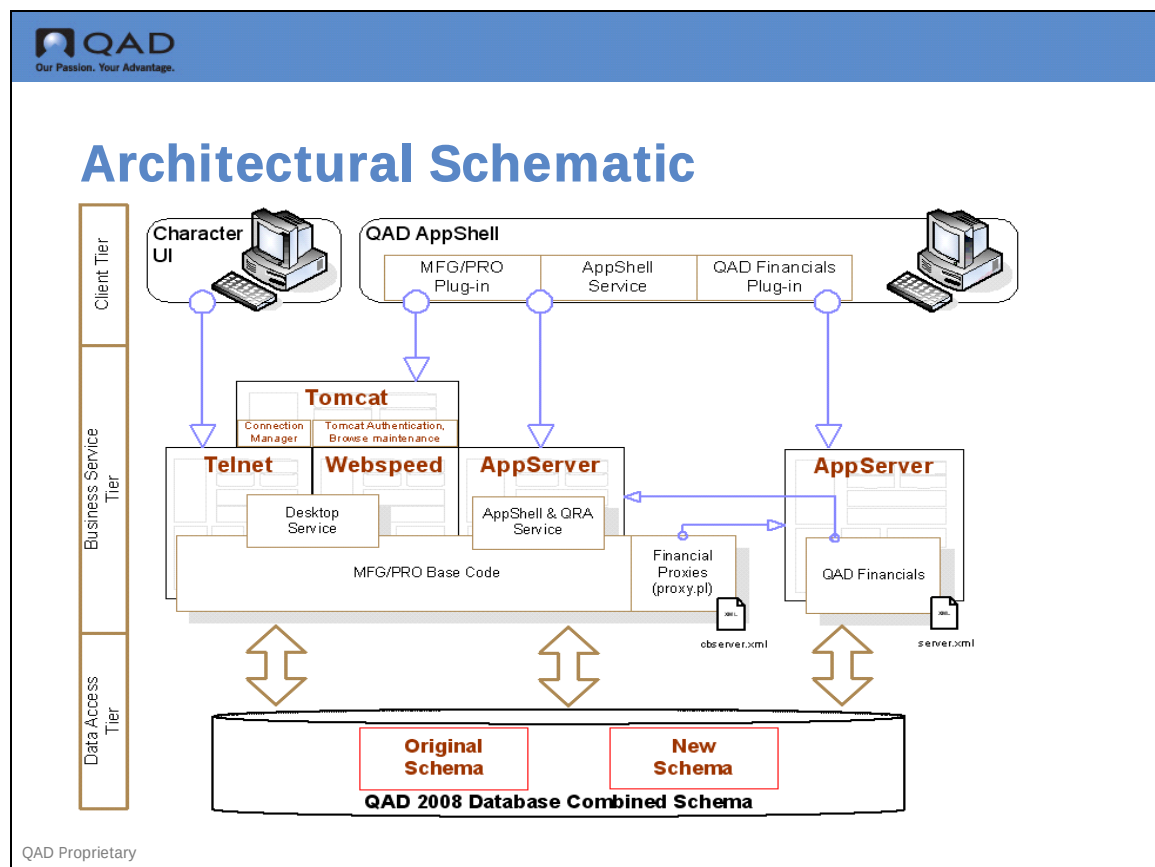


QAD Enterprise Edition

- ▲ QAD Enterprise Edition is a complete enterprise solution that provides QAD Core
 - foundation manufacturing, distribution, financials modules.
 - Sometimes known as “ERP – Enterprise Resource Planning”
- ▲ QAD Enterprise Edition also includes
 - Extensible data and security management features allowing for plug-ins to QAD’s additional solutions
- ▲ In the past, the ERP component was known as MFG/PRO and carried the brands known as eB, eB2, eB2.1, and QAD 2007

QAD Proprietary

Architectural Schematic



Configure



Next : Configuring QAD EE

CONFIGURE



QAD Proprietary

Overview



Overview

- ▲ Connection Manager
- ▲ XML Configuration Files
- ▲ Appservers and Webspeed
- ▲ Applying System Wide Settings

QAD Proprietary

Connection Manager

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Connection Manager

United States File Edit Tools Workspace Window Help

Applications

- Menu Search
- Distribution
- Manufacturing
- Financials
- Customer Services
- Master Data
- Custom
- Supply Chain
- Processes
- Administration
 - Browse Collection
 - Tomcat Manager
 - Connection Manager**
 - Simplified Screens
 - Process Admin
 - Process Editor

Connection Manager

Functions

- Close Connection Manager
- Restart Connection Manager
- Reset failed init count
- Delete HTML cache
- Message of the day
- Update configuration settings

Connections

- All
- Busy
- Idle
- Initializing

Users

- User not yet assigned

Refresh

Connection Manager - Default/Desktop

Thu Apr 26 20:31:52 PDT 2007 All: 2 Busy: 1 Idle: 0 Initializing: 1 Name: All

Status	ID	Process ID	User ID	Device	User IP	Maximum Connections	Program	User Connected Time	Close
Initializing	6	0				0			Close
Busy	5	7853	mfg	/dev/pts/1	10.167.3.1	99	sosomt.p	Thu Apr 26 20:30:55 PDT 2007	Close
Total	2								Refresh Close All

Sales Order Maintenance

Sales Order Maintenance: GO_TO Actions

Order: 10001 Sold-To: 01000000 Bill To: 01000000 Ship-To: 01000000

Sold-To

Colossal Conglomerates LTD
Suite 1000 Colossal Building
Colossal Industrial Park
Evanston
United States of America

IL 090876

Ship-To

Colossal Conglomerates LTD
Suite 1000 Colossal Building
Colossal Industrial Park
Evanston
United States of America

IL 090876

Order Date: 01/25/1998 Line Pricing: ☒ Manual: 10 Confirmed: ☒ 01/25/1994 Language:
Required Date: 01/26/1998 Site: 10000 Currency: USD Taxable: ☒
Promise Date: Due Date: 01/26/1998 Channel: Project: Fixed Price: ☒
Perform Date: Pricing Date: 01/26/1998 Credit Terms: 30
Purchase Order: Credit Terms Interest %: 0.00
Benrice: ☒

mfg

Connection Manager 2



Connection Manager

- ▲ Manages the pool of Telnet connections from the Tomcat Webapp to the QAD business logic
 - There must be idle sessions to launch a new MFG screen
 - The Connection Manager parameters should be configured to
 - Login to the QAD server
 - Change to the QAD Scripts directory
 - Launch the “headless” QAD client script
 - The Tomcat webapp then translates the information from the client script to a format suitable for the .NET user interface

QAD Proprietary

Connection Manager 3


Our Passion. Your Advantage.

Connection Manager

http://hostname:tomcat-port/qadui/admin/

Functions

[Close Connection Manager](#)
[Restart Connection Manager](#)
[Reset failed init count](#)
[Delete HTML cache](#)
[Message of the day](#)
[Update configuration settings](#)

Configuration Parameters

Host:	plli26.qad.com
Port:	23
Startup Script:	/dr01/qdt/envs/env/scripts/connmgr.produc
Server Startup Password:	
Minimum Connections:	8
Maximum Connections:	64
Maximum Failures:	100
Connections Monitor Frequency:	60000
Wait time for Idle Connection:	20000
Connection Timeout:	1800000
Processing Timeout:	2000
Initializing Timeout:	180000
Operating System Win32/NT:	false
Wait Time:	2000

Save

QAD Proprietary

Client Session



Client Session

- ▲ Client Session Configuration File: client-session.xml
 - Located on the server in <Tomcat Install>/webapps/qadhome/configurations/qadui/*client-session.xml*
 - Contains configuration for NameServer, AppServer and Webspeed broker names and ports
 - Appserver can be set to direct connect to bypass the nameserver if network performance is an issue

The application server (AppServer) protocol. The follow values are valid:

```
"AppServer"    Unsecured connection to the name server.  
"AppServerS"   Secure connection to the name server.  
"AppServerDC"  Unsecure connection to the AppServer broker.  
"AppServerDCS" Secure connection to the AppServer broker.
```

QAD Proprietary

Client Session 2



Client Session

▲ client-session.xml : Connection Settings

```
<!--
  <ConnectionHost>plli26.qad.com</ConnectionHost>
  <!--
    The AppServer port number. If using the "AppServer" protocol the
    NameServer port number. The default NameServer port number is 5
    "AppServerDC" protocol this will be the AppServer broker port n
  -->
  <ConnectionPort>5162</ConnectionPort>
  <!--
    The AppServer name.
  -->
  <ConnectionService>qadui_ASPerf</ConnectionService>

  <!-- AppServer secure protocol. Used during the authentication. -->
  <ConnectionSecureProtocol>AppServer</ConnectionSecureProtocol>

  <!-- The secure app server broker name. -->
  <ConnectionSecureService>qadui_ASPerf</ConnectionSecureService>

  <!-- The secure app server host name. -->
  <ConnectionSecureHost>plli26.qad.com</ConnectionSecureHost>

  <!-- The secure app server port number. -->
  <ConnectionSecurePort>5162</ConnectionSecurePort>
```

QAD Proprietary

Client Session 3



Client Session

▲ Client-session.xml : Setting record download limits

```
<!-- Browse section -->
<!--
  The maximum number of records the browse server will be count during a query.
-->
<MaximumBrowseRecordsToCount>50000</MaximumBrowseRecordsToCount>
<!--
  The maximum number of records the browser server will send to the client.
-->
<MaximumBrowseRecordsToDownload>50000</MaximumBrowseRecordsToDownload>
<!--
  If this number of records is exceeded during a browse print operation
  a warning dialog box will be displayed.
-->
<BrowseRecordsForPrintWarning>10000</BrowseRecordsForPrintWarning>
<!--
  If this number of records is exceeded during a browse export to Excel operation
  a warning dialog box will be displayed.
-->
<BrowseRecordsForExcelWarning>10000</BrowseRecordsForExcelWarning>
<Browse>
  <!-- Auto refresh rate in seconds -->
  <DefaultRefreshRate>30</DefaultRefreshRate>
</Browse>
```

QAD Proprietary

Client Session 4



Client Session

▲ Client-session.xml : Financials Connections

```

<!-- QAD Financials Settings -->
<configSections>
  <section name="cachingConfiguration" type="Microsoft.Practices.EnterpriseLibrary.Caching.Configuration.CacheManagerSettings, Microsoft.Practices.EnterpriseLibrary.Caching, Version=3.1.0.0,
    al, PublicKeyToken=c0359ed26d3edeb6" />
  <section name="qad.logging" type="QAD.BaseTypes.LogConfigHandler, QAD.BaseTypes" />
  <section name="qad.appserver" type="QAD.AppServer.ASConfigHandler, QAD.AppServer" />
</configSections>

<!-- Financials AppServer URL -->
<qad.appserver url="AppServer://p11i26.qad.com:5162/qadfinPhysioPerf">
</qad.appserver>

<TranslationTracing></TranslationTracing>
<RemotingURL></RemotingURL>
<!--
    Directory where report files (*.rpt) are stored. Only one directory
    can be specified.
    Ex. ..\..\..\QadFinForms\QadFinForms\Reports\
-->
<ReportFolder>${qad.plugin.financials/installation/directory}\Reports</ReportFolder>
<!--
    Directory where the application is looking for images.
  
```

QAD Proprietary

Client Session 5



Client Session

▲ Client-session.xml : Debugging

```

<!--
Specify detail level of messages stored in ct*.log file.
Possible values:
    "0": Nothing
    "1": Business code
    "2": DB access
    "3": Business code + DB access
-->
<BLDebugLevel>0</BLDebugLevel>

<!--
Specify whether UI messages should be logged. If it is activated,
then they are logged to the system Event Log and can be seen in the
Possible values:
    "on": Messages are logged
    "off": Logging is disabled
-->
<LogEnabling>off</LogEnabling>

<!--
Specify detail level of messages logged by the UI.
Possible values:
    "exception": Logs only unhandled exceptions
    "error":     Logs also expected errors
    "warning":   Logs also warning messages
    "message":   Logs all messages produced by the UI
-->
<LogLevel>0</LogLevel>

```

QAD Proprietary

Client Session 6



Client Session

▲ Client-session.xml : SSH instead of Telnet

```

<!-- Terminal Section -->
<!--
  A URL to the Routrek.Granados.dll file located on the HomeServer that is required
  for terminal connections using the SSH protocol. This file is not delivered with the QAD .NET UI
  due to exportation laws regarding encryption.

      Download      http://www.routrek.co.jp/support/download/varaterm/granados200.tar.gz
      File          Routrek.Granados.dll
      Size          143,360 bytes
      Version       2.0.0.0
      SHA-1 Hash    10432c3ebbb8b754ef98b89bbd54db674df0f012      # Use shasum on Linux or :
xe -shal on Windows (see http://support.microsoft.com/kb/841290)
-->
  <SshProviderUrl>${HomeServer}/Routrek.Granados.dll</SshProviderUrl>

<!--
  The protocol to use during terminal connections. The following values are valid:

      telnet      Unsecure telnet protocol.
      ssh1       Secure SSH1 protocol.
      ssh2       Secure SSH2 protocol.
-->
  <TerminalProtocol>telnet</TerminalProtocol>

```

QAD Proprietary

Embedded Telnet Screen Settings

Embedded Telnet Screen Settings

▲ Embedded telnet screen login is defined in 36.20.10.3:

The screenshot displays the 'Embedded Telnet Screen Settings' window within the QAD Enterprise Applications environment. The window is titled 'qaddemo: United States (1) - QAD Enterprise Applications'. The left sidebar shows a tree view with 'Applications' expanded, listing 'user opt' and 'User Option Telnet Maintenance...'. The main area contains the following settings:

- User ID:** *
- Telnet Options:**
 - Host: qaddemo.qad.com
 - Host O/S: UNIX
 - Port: 23
 - Image:
 - Script Timeout: 30
 - Idle Timeout: 90
- Script Lines:**
 - Sequence: 1
- Script Lines Data:**
 - Script Pattern: login:
 - Script Value: mfg
 - Script Status:
- Telnet Connections:**
 - Maximum: 5
 - Minimum: 0

At the bottom right, there are three buttons: 'Delete', 'Back', and 'Next'.

ubroker.properties



\$DLC/properties/ubroker.properties

▲ Appserver and WebSpeed setup

- Set PROPATH, port numbers, logging level, connection parameters, max / min instances

```
[UBroker.AS.qadui_ASPerf]
  appserviceNameList=qadui_ASPerf
  brokerLogFile=/dr01/qdt/logs/qadui_ASPerf.broker.log
  controllingNameServer=NS1
  description=UI AppServer
  environment=qadui
  initialSrvrInstance=5
  maxSrvrInstance=10
  minSrvrInstance=1
  operatingMode=Stateless
  portNumber=51300
  PROPATH=/dr01/qdt/envs/Perf/configs:/dr02/QAD2008.1EE/qadui/com/mfgpro:/
QAD2008.1EE:/dr02/QAD2008.1EE/bbi:/dr02/QAD2008.1EE/fin:/dr02/QAD2008.1EE/q
n/proxypatch:/dr02/QAD2008.1EE/fin/proxy.pl:/dr02/QAD2008.1EE/xrc:/dr01/prog
  srvrActivateProc=
  srvrConnectProc=
  srvrLogFile=/dr01/qdt/logs/qadui_ASPerf.server.log
  srvrMaxPort=52120
  srvrMinPort=52111
  srvrShutdownProc=
  srvrStartupParam=-s 128 -mmax 16000 -inp 32000 -tok 20000 -TB 31 -TM 32
-D 100 -nb 200 -noshvarfix -cpinternal ISO8859-1 -cpstream ISO8859-1 -pf /d
ts/base-live-set.pf
  srvrStartupProc=mfaistrt.p
  sslEnable=
```

QAD Proprietary

System Wide Settings



System Wide Settings

▲ Client Logging

- Set in `./webapps/qadhome/configurations/default/client-bootstrap.xml`
- Examples: Log level, log file location

```
<!-- A threshold limiting the type of information that will be logged for all log
threshold has not been set [Off, Error, Warn, Info, Debug].    (bootstrap only) -->
<log.level>INFO</log.level>

<!-- The location of the file on the client where logging output should be written
(bootstrap only) -->
<log.file>${storage/directory}\QAD.Applications.log</log.file>

<!-- The maximum size of the log file in kilobytes.  When the maximum size is reached,
the log file is renamed as a backup and a new log file is created [integer].    (bootstrap only) -->
<log.file.size>5000</log.file.size>

<!-- The number of log file backups that should be retained.  When the maximum number
of backups is reached, the oldest log file backup is deleted [integer].    (bootstrap only) -->
<log.file.backups>5</log.file.backups>

<!-- When true application styling is enabled [boolean].    (bootstrap only) -->
<style.enabled>true</style.enabled>
```

QAD Proprietary

System Wide Settings 2



System Wide Settings

▲ Adding Menus in .NET UI

– Set in `./webapps/qadhome/configurations/default/menus/plugin-menu.xml`

```
<Properties>
<Property name="Admin" value="ADMINISTRATION" type="label" />
<Property name="ConnectionManager" value="CONNECTION_MANAGER" type="label" />
<Property name="TomcatManager" value="TOMCAT_MANAGER" type="label" />
<Property name="ProcessEditor" value="PROCESS_EDITOR" type="label" />
<Property name="ProcessLabelMaint" value="PROCESS_LABEL_MAINTENANCE" type="label" />
<Property name="ProcessAdmin" value="PROCESS_ADMIN" type="label" />
<Property name="SimplifiedScreensAdmin" value="CONFIGURABLE_SCREEN" type="label" />
<Property name="BrowseCollection" value="BROWSE_COLLECTION" type="label" />
<Property name="BrowseCollectionMaintenance" value="BROWSE_COLLECTION_MAINTENANCE" type="label" />
<Property name="MenuCollectionMaintenance" value="MENU_COLLECTION_MAINTENANCE" type="label" />
<Property name="DesktopBaseUrl" value="DesktopBaseUrl" type="config" />
<Property name="AttachmentMaintenance" value="ATTACHMENT_MAINTENANCE" type="label" />
<Property name="QPS2" value="QPS2" type="label" />
<Property name="AddOn" value="ADD_ON" type="label" />
</Properties>
<Workspaces>
```

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Limiting User Connections



Limiting User Connections

- ▲ Set Session Configuration
 - Can set maximum number of forms each user can open
 - Setting it too high can impact performance
 - Set in User Option Telnet Maintenance

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Limiting User Connections 2

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Limiting User Connections

User Option Telnet Maintenance... X

Go To Action

User ID: *

Telnet Options

Host: exli17.qad.comScript Timeout: 999
Host O/S: UNIXPort: 23Image:Idle Timeout: 999

Script Lines

Sequence: 1

Script Lines Data

Script Pattern: login:
Script Value: qad201
Script Status:

Telnet Connections

Maximum: 5Minimum: 1

DeleteBackNext

QAD Proprietary

Administration



Next : Administration of the UI

ADMIN



QAD Proprietary

Overview



Overview

- ▲ Session Monitoring
 - Users
 - Audit Reports
- ▲ Custom Menu Items
- ▲ Manage Licenses
- ▲ Starting and Stopping

QAD Proprietary

Session Monitoring



Session Monitoring

- ▲ Session Master Maintenance
 - No maintenance done in this screen
 - Can be used to delete defunct users
 - Specifies a system generated session ID
- ▲ Connection Manager
 - Monitor which users are accessing system / programs
 - View status of connection pools
- ▲ Heartbeat Monitor
 - Configure load balancer device or create script that monitors the Connection Manager through heartbeat pages
- ▲ User Count Log file
 - Logs user, program executed and time of execution
 - Located in `./webapps/<qaduicfg>/WEB-INF/logs/usercount.log`

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Session Master Maintenance


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Session Master Maintenance

Session Master Maintenance
 Session Master Maintenance

Go To
 Actions
 Copy
 Print
 Preview

Session ID: 020020g7488GpxsiteAWbPtlLM7wJUywwVhP9EwtjSibsB0IM0
 User ID: mfg
 User Name: mfg

Session Master

Client IP Address: 167.3.204.36	Security Profile:
Session Timeout: 0 Min	Idle Time: 0.30 Min
Active Web: 0	Active Telnet: 2
Number of Records: 0	Menu Substitution:

Session Context Detail

Context ID: 1	Domain: Physio
GLEntity: 15	Current Entity: 15
	Base Currency: USD
	Database: qaddb

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Heartbeat Monitor



Heartbeat Monitor

- ▲ `http://[host]:[port]/webapp/heartbeat/[command].jsp`
- ▲ `status.jsp` — returns a status message containing the number of agents that are All / Idle / Init / Busy.
All: 10
Busy: 2
Init: 0
Idle: 8
- ▲ `idle.jsp` — returns idle connections
- ▲ `busy.jsp` - returns busy connections
- ▲ `init.jsp` - returns initializing connections

QAD Proprietary

User Count Log File



User Count Log File

▲ [tomcat]/webapps/qadui/WEB-INF/logs

```
2009-04-18 04:00:11,586 servletcontextpath=%2Fdr02%2Ftomcat%2Fwebapps%2Fqadui%2F t
2009-04-18 12:31:17,423 apisource=AppShell at=s d=Physio ip=167.3.3.8 s=020020j17Z
cY8pLcP0f3oZpTNw0 sid=020020j17Zven2rg0qVWN0X0Yt fus9HJ0cY8pLcP0f3oZpTNw0 t=li u=mf
2009-04-18 12:36:59,290 a=sosomt.p apisource=AppShell at=s d=Physio s=020020j17Zve
8pLcP0f3oZpTNw0 sid=020020j17Zven2rg0qVWN0X0Yt fus9HJ0cY8pLcP0f3oZpTNw0 t=ai u=mfg
2009-04-18 12:37:14,963 a=sosomt.p apisource=AppShell at=s d=Physio s=020020j17Zve
8pLcP0f3oZpTNw0 sid=020020j17Zven2rg0qVWN0X0Yt fus9HJ0cY8pLcP0f3oZpTNw0 t=ai u=mfg
2009-04-18 12:37:32,821 a=sosomt.p apisource=AppShell at=s d=Physio s=020020j17Zve
8pLcP0f3oZpTNw0 sid=020020j17Zven2rg0qVWN0X0Yt fus9HJ0cY8pLcP0f3oZpTNw0 t=ao u=mfg
2009-04-18 12:39:19,421 a=sosomt.p apisource=AppShell at=s d=Physio s=020020j17Zve
8pLcP0f3oZpTNw0 sid=020020j17Zven2rg0qVWN0X0Yt fus9HJ0cY8pLcP0f3oZpTNw0 t=ai u=mfg
2009-04-18 12:39:28,111 a=sosomt.p apisource=AppShell at=s d=Physio s=020020j17Zve
8pLcP0f3oZpTNw0 sid=020020j17Zven2rg0qVWN0X0Yt fus9HJ0cY8pLcP0f3oZpTNw0 t=ao u=mfg
```

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Adding Custom Menus

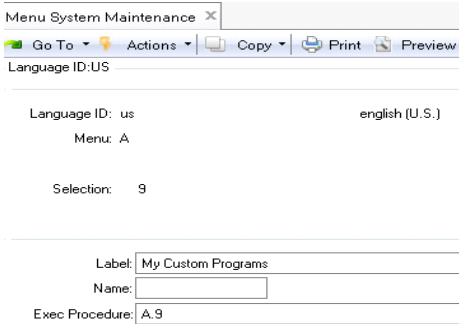


Adding Custom Menus

▲ **Menu System Maintenance**

Example: Add menu 88.1 under new menu group called “My Custom Menu Group”:

- Create an entry for A.9. Assign a label (ex. My Custom Programs) and execute procedure of “A.9”
- Create an entry for A.9.88. Assign a label (ex. Custom Sales Orders) and execute procedure of “88”
- Create an entry for 88.1. Assign a label (ex. Custom Sales Order Maintenance) and execute procedure with the program name (for example: “xxsomt.p”).
- Go to “Role Permissions Maintain” and Enable Menu based on Role



Menu System Maintenance

Go To Actions Copy Print Preview

Language ID: US

Language ID: us english (U.S.)

Menu: A

Selection: 9

Label: My Custom Programs

Name:

Exec Procedure: A.9

Language ID: us

Menu: A.9

Selection: 88

Label: Custom Sales Orders

Name:

Exec Procedure: 88

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Adding Custom Menus 2



Adding Custom Menus

Menu:

Selection:

Label: Custom Sales Order Maintenance
Name:
Exec Procedure: xxsosomt.p

Menu System Maintenance X Role Browse for Permissions X
Go To Actions Tools Attach Print Preview
Language ID: US
Program Information Maintenance
Program: xxsosomt
Label: Custom Sales Order Maintenance
Multi Domain: ☐
Web Options
Image:
Web Logic Implemented: ☐
Type:

Role Permissions Maintain X Role Browse for Permissions X Menu System Maintenance
Go To Actions Tools Attach Print Preview
Attachments
Role Name:
Role Description:
Filter:

- ☒ Secured items on menu
 - ☒ Customer Management
 - ☒ Supply Chain
 - ☒ Manufacturing
 - ☒ Financials
 - ☒ Master Data
 - ☒ System Administration
 - ☒ Processes
 - ☒ My Custom Programs
 - ☒ Custom Sales Orders (88)
 - ☒ Custom Sales Order Maintenance (88.1) [Domain]
- ☒ Secured items not on menu

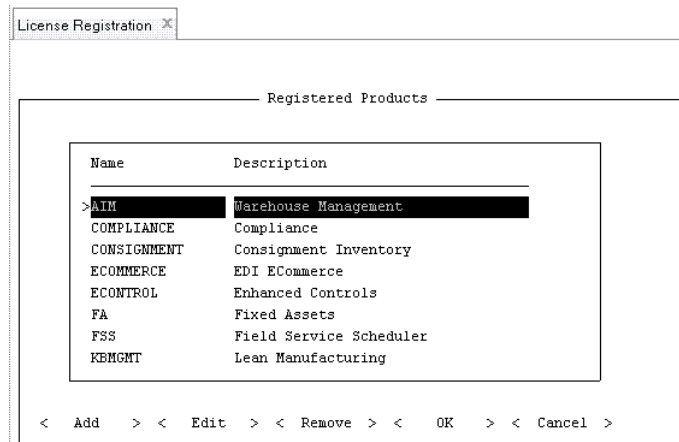
QAD Proprietary

Managing Licenses

Managing Licenses

▲ License Registration

- Add new modules
- Upgrade codes to add new sessions or users
- Remove licenses



QAD Proprietary

Starting and Stopping Sequence



Starting and Stopping Sequence

▲ Starting QAD Enterprise Edition

- Start the Progress Admin Server
- Start the Databases
- Start the Appservers and Webspeed
- Start Tomcat

▲ Stopping QAD Enterprise Edition

- Stop Tomcat
- Stop the Appservers and Webspeed
- Stop the Databases
- [optional] Stop the Progress Admin Server

QAD Proprietary

Chapter 3

Security, Reporting, and Daemons

QAD Enterprise Edition

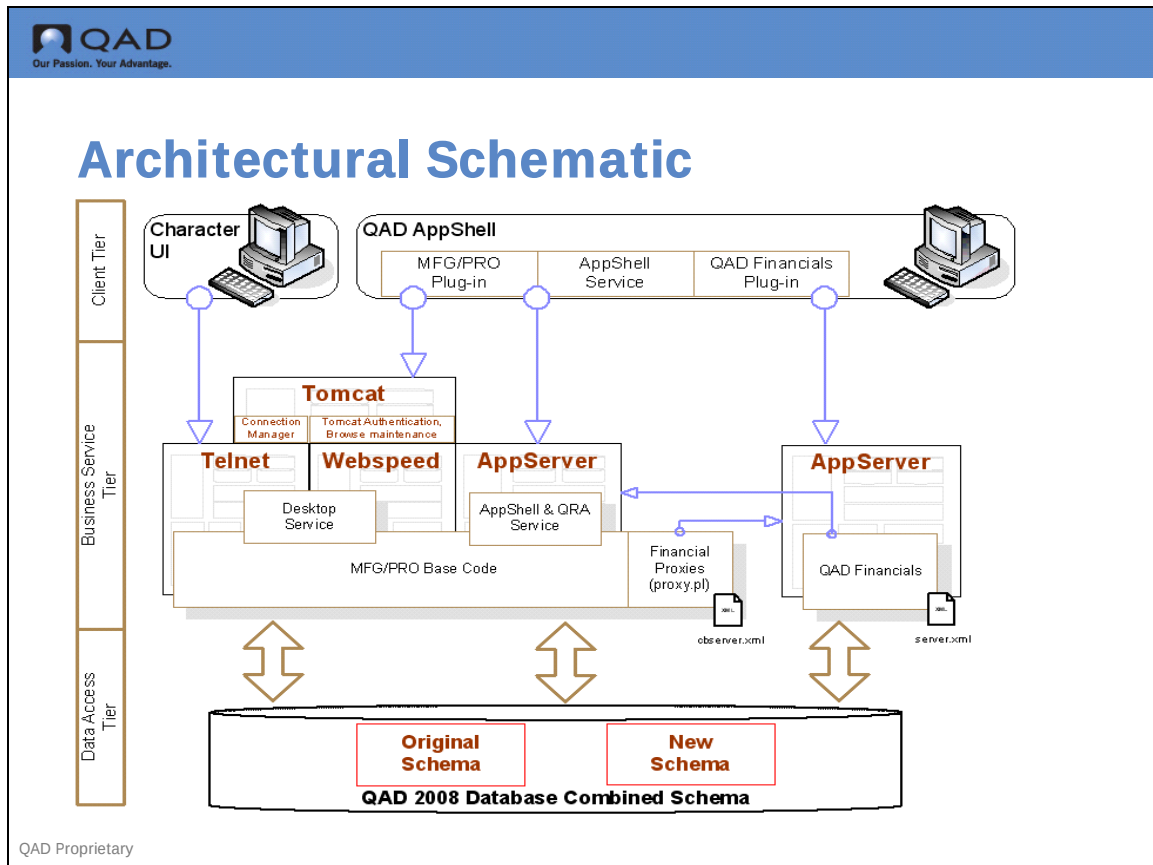


QAD Enterprise Edition

- ▲ QAD Enterprise Edition is a complete enterprise solution that provides QAD Core
 - foundation manufacturing, distribution, financials modules.
 - Sometimes known as “ERP – Enterprise Resource Planning”
- ▲ QAD Enterprise Edition also includes
 - Extensible data and security management features allowing for plug-ins to QAD’s additional solutions
- ▲ In the past, the ERP component was known as MFG/PRO and carried the brands known as eB, eB2, eB2.1, and QAD 2007

QAD Proprietary

Architectural Schematic



Security



Next : Securing QAD Enterprise Edition

SECURITY



QAD Proprietary

Security Overview



Security Overview

- ▲ The QAD Enterprise Applications Security Model
 - Integrates system components
 - Controls access to the system
 - Defines actions that can be performed
- ▲ The QAD Enterprise Applications Security Features
 - Configure login behaviour
 - Define password strategies
 - Create / Maintain users and roles
 - Specify user access to domains and entities
 - Specify user access to menus and programs

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Security Model

Domain/entity security restricts access based on user ID.

Role-based security prevents access to screens.

Site security controls access to sites.

Field security prevents users from updating values for specific fields.

The screenshot shows the 'Sales Order Maintenance' window for 'Sales Order: SO101'. The window is divided into several sections: 'Header', 'Sold-To', 'Ship-To', and 'Details'. The 'Header' section contains fields for 'Order: SO101', 'Sold-To: 4000', 'Bill To: 4002', and 'Ship-To: 4000'. The 'Sold-To' section shows 'ABC Company', '150 JFK Parkway', 'Morristown, NJ 07960', and 'United States'. The 'Ship-To' section shows 'ABC Company', '150 JFK Parkway', 'Morristown, NJ 07960', and 'United States'. The 'Details' section contains various dates and pricing information, including 'Order Date: 02/04/2007', 'Required Date: 02/05/2007', 'Promise Date:', 'Due Date: 02/05/2007', 'Perform Date:', 'Pricing Date: 02/04/2007', 'Purchase Order:', 'Remarks:', 'Line Pricing: [checked]', 'Manual: [checked]', 'Site: 10000', 'Channel:', 'Project:', 'Org Inv:', 'Confirmed: [checked]', 'Currency: USD', 'Language: US', 'Taxable: [checked]', 'AST', 'Fixed Price: [checked]', 'Credit Terms: Base', 'Credit Terms Interest %: 0.00', and 'Reprice: [checked]'. The 'Details' section also has a 'Back' and 'Next' button.

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Security Controls

Security Controls

▲ Defines password strategy

Security Control X

Go To Actions Copy Print Preview

Timeout Minutes: 0

Enforce Licensed User Count: ☐

Enforce OS User ID: ☐

Header Display Mode: 0 Display Date

Maximum Access Failures: 0

Administrator Role:

Email System:

Logon History Level: 00

Enabled Reason Type: USER_ACT

Auto-Disablement Reason:

Single Sign On Enabled: ☐

Password

Minimum Length: 0

Min Numeric Characters: 0

Min Non-Numeric Characters: 0

Minimum Reuse Days: 0

Minimum Reuse Changes: 0

Password Creation Method: No

Password Expiration Days: 0

Warning Days: 0

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Security Menu Programs

		
Security Menu Programs		
Program No.	Description	Program Name
36.3	System Security Menu	
36.3.1	User Maintenance	mgurmt.p
36.3.2	User Inquiry	mguriq.p
36.3.3	User Password Maintenance	mgurmt.p
36.3.4	User Domain/Entity Access Maintain	BUser.Modify
36.3.5	User Domain/Entity Access View	BUser.UsrCompanyDomainAccess
36.3.6	Role Maintenance	
Program No.	Description	Program Name
36.3.6.1	Role Create	BRole.Create
36.3.6.2	Role Modify	BRole.Modify
36.3.6.3	Role View	BRole.View
36.3.6.4	Role Delete	BRole.Delete
36.3.6.5	Role Permission Maintain	BRole.Permissions
36.3.6.6	Role Membership Maintain	BUserRole.Maintain
36.3.6.8	Role Permissions View	BRole.RoleDefinition
36.3.6.9	Role Membership View	BUserRole.RoleMembership
36.3.6.10	User Access View	BUser.Useraccess
36.3.6.11	Role Export	BRole.Export
36.3.6.12	Role Import	BRole.Import

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Role Based Security

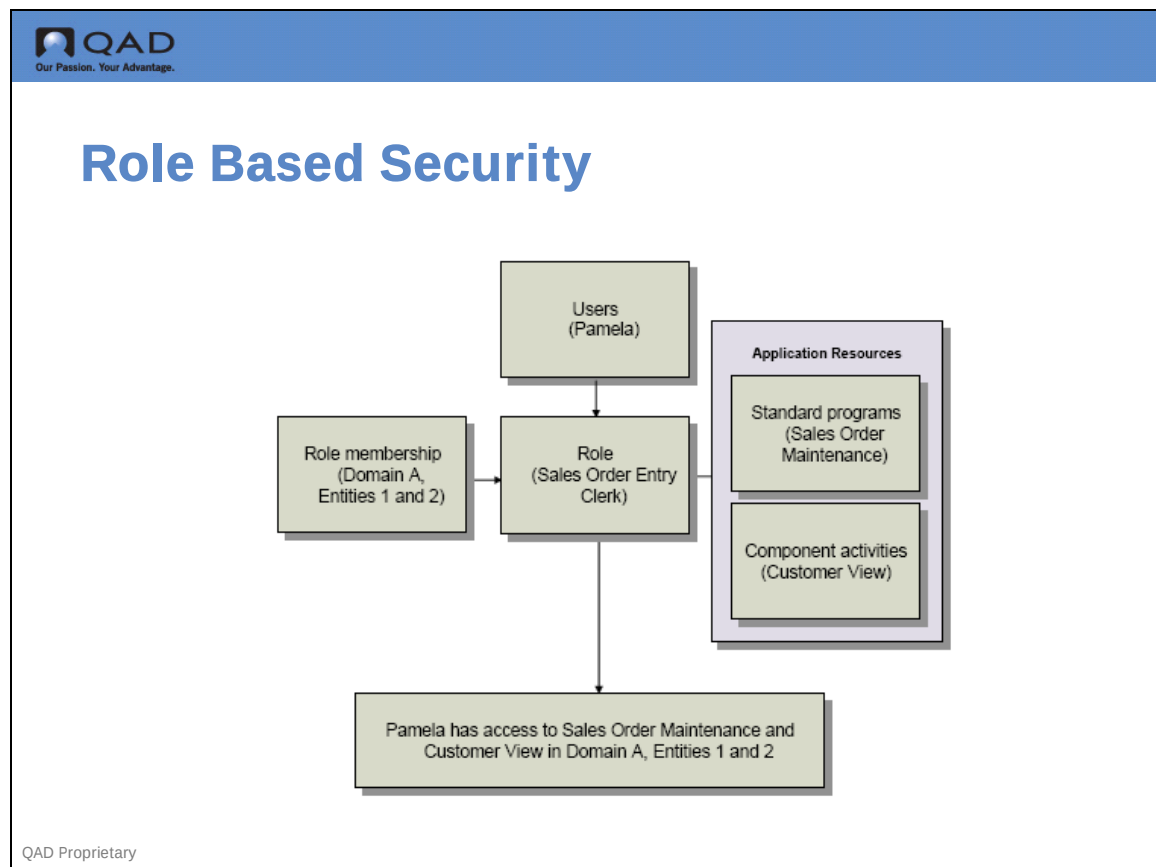


Role Based Security

- ▲ Restricts user access to domains, entities and menu level functions
- ▲ Roles
 - Logical subset of activities
 - A user can have one or more roles
 - Example roles
 - sysadmin, AR, accountant, shopfloor
- ▲ Role Permissions
 - Allowed functionality within a role
 - Access to Menus
 - Ability to create / update / view / delete data
 - Access to specific fields

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Role-Based Security 2



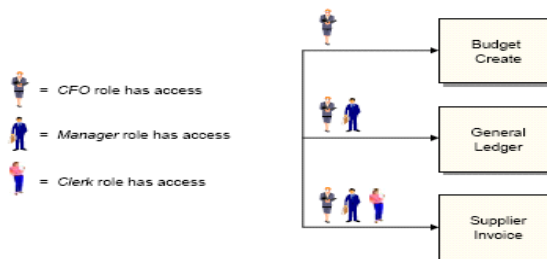
Role Membership



Role Membership

▲ Role Membership Maintain

- Associates users and roles
- Domains and Entities where the role applies
- Access must be explicitly granted to users for each entity within a domain
 - Financial roles only



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Additional / Specific Security



Additional / Specific Security

- ▲ The following programs exist which have specific security functionality
- ▲ Security is defined by user, role, or both
 - Field Security Maintenance
 - Update Restrictions
 - GL Account Security Maintenance
 - Site Security Maintenance
 - Inventory Movement Code Security

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Single Sign-on Security



Single Sign-on Security

- ▲ Windows only
- ▲ Set in Security Control Maintenance
- ▲ Allows for secure login to the Window environment
 - Access to the .NET UI has no security login, Window credentials are passed through.

QAD Proprietary

Enforce OS-UserID



Enforce OS-Userid

- ▲ Set in Security Control Maintenance
- ▲ Sets the login ID to the OS login ID
 - Cannot be changed
 - If no QAD passwords are associated with this ID, then this allows automatic login to QAD applications without a security prompt
 - Supports Microsoft Active Directory
 - Centrally Managed security on AD server

QAD Proprietary

Monitoring Security



Monitoring Security

- ▲ Users can be locked out of system if there are too many failed attempts
 - Set in Security Control Maintenance
- ▲ Logon Attempts can be examined

QAD Proprietary

Reporting



Next :

REPORTING

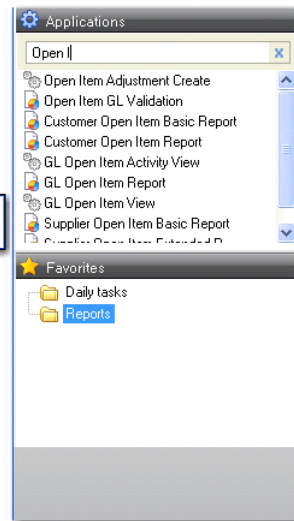
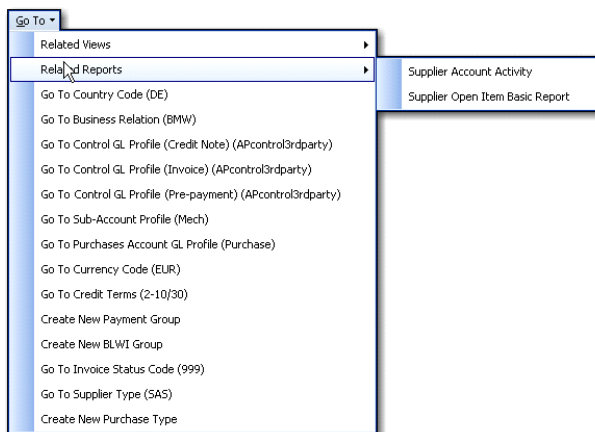


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Standard Reports

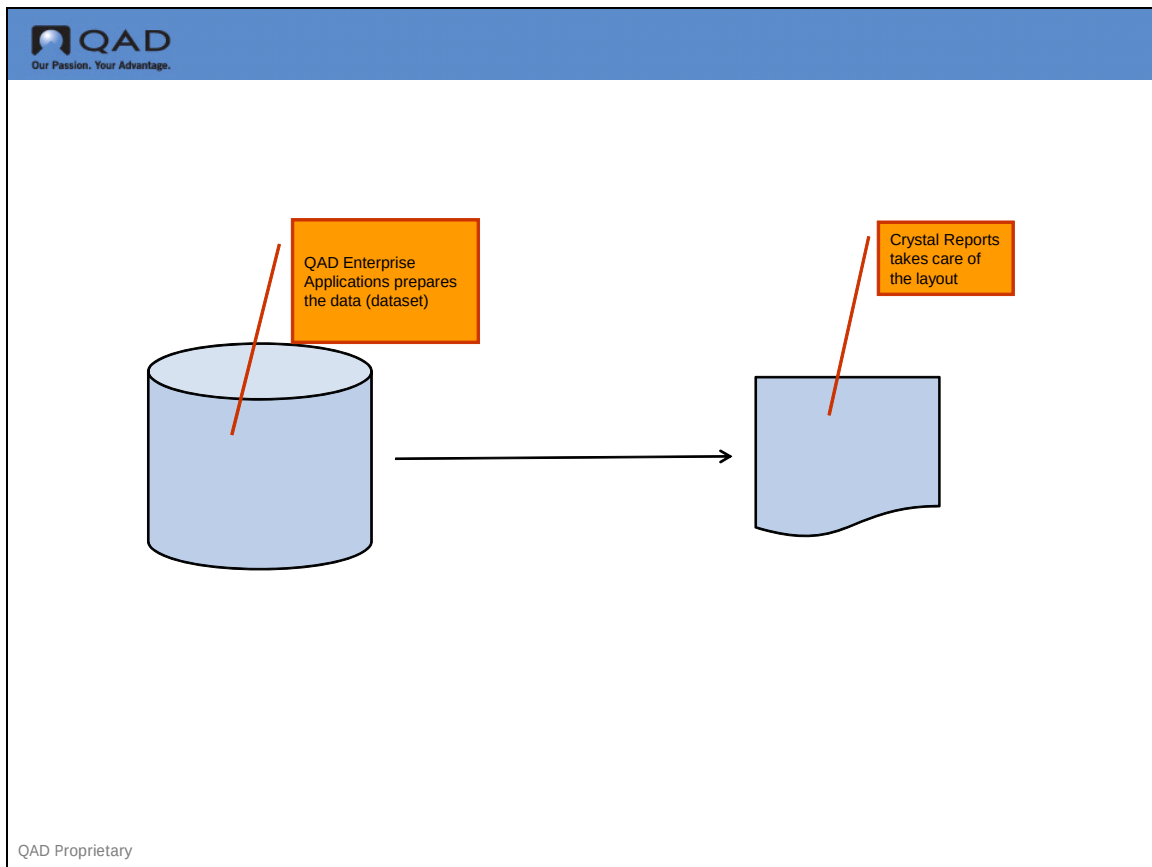
Standard Reports

- ▲ Cover all areas of the QAD Enterprise Financials
- ▲ Extensive functionality in report creation & management
- ▲ Accessible
 - From the main menu
 - Via GoTo



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Reporting Architecture



Standard Reports Selection

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Standard Reports Selection

SAF Code Trans Detail Report

Tools | Print | Preview | Variant

Report Variants

Filter

GL Period: All | GL Cal Year: All | Amounts in MC: [dropdown]

Check if History is up to date: [checkbox] | Entity: 999 - SYSADM, CAN-01, CONS-EMEA, CONS-US, EMEA-DE | Currency: [dropdown]

Sub-Account: [dropdown] | GL: [dropdown] | Active GL Account: [dropdown]

Server Output Processing

Schedule... | Execute | Close

Execute now or schedule for later

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Standard Reports Output

Standard Reports Output

- ▲ View in new window
- ▲ Print, export, email

Cost Center Trans Summary R_ X

Tools | Print | Preview | Variant

Report Variants

Filter

Grouping Level 2: Cost Center | Grouping Level 3: GL | Grouping Level 4: All | Grouping Level 5: All | Grouping Level 6: All

Server Output Processing

- ☐ To Printer
- ☒ To File
- ☐ E-Mail to Addresses
- ☐ E-Mail to Roles

Output Format: Adobe Acrobat (PDF)

Cost Center Transaction Summary

Filter Values for this Report

COA Code	Description	Company Period	Opening Balance	Period Activity	Closing Balance	Curr Period Activity	Unit	Period Quantity
Admin	Administration	0.00 01	0.0001	16.010.0001	16.010.0001	EUR	16.010.0001	0.00
40000	Travel Expenses	0.00 01	0.0001	2.000.0001	2.000.0001	EUR	2.000.0001	0.00
40000	General Services	0.00 01	0.0001	2.000.0001	2.000.0001	EUR	2.000.0001	0.00
40100	IT Expenses	0.00 01	0.0001	5.500.0001	5.500.0001	EUR	5.500.0001	0.00
40100	General Services	0.00 01	0.0001	6.500.0001	6.500.0001	EUR	6.500.0001	0.00
40000	General Services	0.00 01	0.0001	5.500.0001	5.500.0001	EUR	5.500.0001	0.00
40000	General Services	0.00 01	0.0001	5.500.0001	5.500.0001	EUR	5.500.0001	0.00

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Report Customizations



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Report Customizations

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Report Customization Levels



Report Customization levels

- ▲ Usage
 - Filter fields management, report options, variants
 - Using QAD .Net UI
- ▲ Layout
 - Using Crystal reports designer
- ▲ Business Logic
 - Requires source code customization

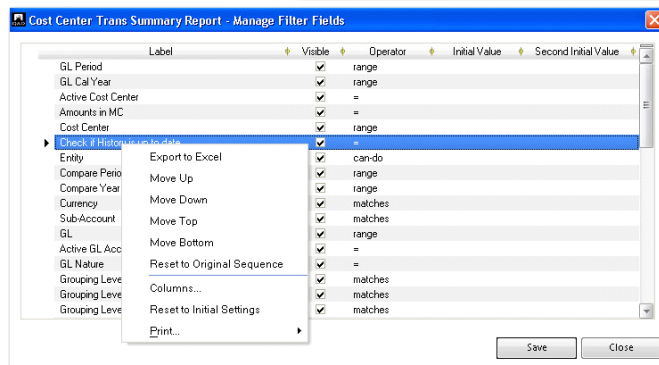
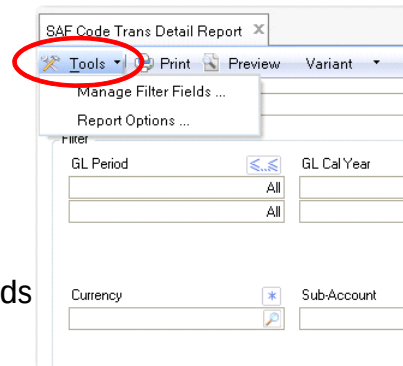
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Usage Customization



Usage Customization

- ▲ Use filter fields
 - Define how data is filtered
- ▲ Manage filter fields
 - Select from the list of available filter fields
 - Set the sequence of the fields on the UI
 - Set initial values



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Usage Customization 2



Usage Customization

- ▲ Report options
 - date format
 - language
 - numeric format
 - filter data on report y/n
 - alternate shading
 - user defined fields

SAF Code Trans Detail Report - Report Options

Language Code: [dropdown]
Date Format: mdy [dropdown]
Date Separator: / [dropdown]
Decimal Point: . [dropdown]
TC Number of Decimals: 2 [text]
Filter Print Mode: [dropdown]
Page Break Mode: [checkbox]
Use Alternate Shading: [checkbox]
Mail Subject: Result of Report SAF Code Transaction Detail [text]
Mail Body: [text area]
Report File: [dropdown]
End User Field: [dropdown]
End User Field Description: [dropdown]
Resultant Field: [dropdown]
Save Close

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Report Variants



Report Variants

- ▲ Specific selection criteria can be stored
 - Available next time the report is started
 - Unlimited number of variants
 - Saved for personal usage or shared with other users

- ▲ All variants...
 - are based on the same data
 - use different filter criteria
 - can use a different report layout

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Report Variants 2

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Report Variants

Cost Center Trans Summary R... X

Tools | Print | Preview | Variant

Report Variants

Filter

Grouping Level 2 * Grouping Level 3 * Grouping Level 4 * Grouping Level 5 *

Cost Center GL All All

Grouping Level 7 * Grouping Level 8 *

All All

SAF Code 1 SAF Code 2

SAF Concept 1 SAF Concept 2

Subtotals * With Opening Balance

All

Server Output Processing

Cost Center Trans Summary Report - Save Variant As

Name MyVariant

Description

Level User

Role Name Role System User

Company Dependent

Save Close

QAD Proprietary

Layout Customization



Layout customization (Crystal Report Designer)

- ▲ Associated with standard report or variant
- ▲ Crystal Report design skills required
- ▲ Examples :
 - Change sort order
 - Add / remove columns
 - Other business fields of the objects in the report
 - User-Defined Fields (UDF) of the objects in the report
 - Calculated fields
 - Add / remove break levels (subtotals)
 - Change fonts, logo, other graphics

QAD Proprietary

Report Framework Basic



Report Framework Basics

- ▲ Report Layout types :
 - *Native report layout*
 - Contains all data fields for the report and their positioning
 - No formatting information (font, size, colors, background, ...)
 - *Template layout*
 - Contains formatting information (font, size, colors, background, ...)
 - Defines header and footer content
 - Few templates serve many native reports
 - Specific for Portrait and Landscape layout
 - A Native layout is merged with its proper Template into an *Actual report layout*

Report Modifications



Report modifications

- ▲ Types:
 - Formatting
 - Content
- ▲ Two ways of making these modifications:
 - Directly in the actual report
 - In the native and/or template report + use merge tool

Crystal Reports Designer

Crystal Reports Designer

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Report Sections

Report Design Panel

Field Report Explorer

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Crystal Reports Designer 2



Crystal Reports Designer

- ▲ Report sections:
 - A report layout contains several sections:
 - report header and footer
 - page header and footer
 - group header and footer
 - detail section
- ▲ Report / Field explorer
 - Field explorer: list of all available fields
 - Database fields
 - Formula's (calculated fields)
 - Report explorer : overview of fields on the report per section
- ▲ Report design panel:
 - drag fields from field explorer into the design panel

User-Defined Fields



Usage of User-Defined Fields (UDF)

- ▲ Add / remove fields :
 - Standard fields
 - UDF's
- ▲ UDF's
 - User can decide per report which UDF's must be available in the report (report options)
 - The selected UDF's can be dragged to the proper location in the report.

Report Layout Customization Example



Report layout customization: example

- ▲ Report : Customer Statement of Account
- ▲ Scenario :
 - Make a UDF 'Transaction Type' available for a report
 - Edit layout
 - Data formatting : suppress leading zero's
 - Position address info
 - Add the UDF to layout
 - Add logo

QAD Proprietary

Report Layout Customization Example 2



BEFORE

Statement of Account

AFTER

Statement of Account



Date: 27/9/2007

ABC Company
150 JFK Parkway
07960 Morrisown
United States of America

Dutley Office
Waterfront Business Park
Waterfront West
JingMae Tower
D15 1LK Birley Hill
Belgium Baillards
Phone: 5922301
Fax: 5922302-3456
Email: jao@qad.com

Dear Sir or Madam,

Your account now shows the following list of open items. If there are any discrepancies please inform us.

Yours faithfully

Mike Taylor
Credit Controller
9662201

Overdue	Voucher	Type	Creation Date	Due Date	Invoice Amt	Open Balance
Yes	20071004-SANK-00000006	Prepayments	30/01/2007	03/05/2007	-2,713.00	-2,713.00
No	20071004-0610000015	Invoice	29/09/2007	29/12/2007	4,952.00	4,952.00
Open Amount by Currency : EUR					1,239.00	1,239.00
Yes	2006-Pan100000189	Invoice	29/11/2006	02/03/2007	106.00	106.00
Yes	2006-Pan100000190	Invoice	30/11/2006	03/03/2007	106.00	106.00
Yes	2006-Pan100000194	Invoice	04/12/2006	07/03/2007	106.00	106.00
Yes	2006-Pan100000193	Invoice	04/12/2006	07/03/2007	106.00	106.00
Yes	2006-Pan100000191	Invoice	04/12/2006	07/03/2007	106.00	106.00
Yes	2006-Pan100000195	Invoice	05/12/2006	08/03/2007	106.00	106.00
Yes	2006-Pan100000196	Invoice	05/12/2006	08/03/2007	106.00	106.00
Yes	2006-Pan100000197	Invoice	05/12/2006	08/03/2007	106.00	106.00
Yes	2006-Pan100000198	Invoice	05/12/2006	08/03/2007	106.00	106.00
Yes	2006-Pan100000203	Invoice	20/12/2006	23/03/2007	106.00	106.00
Yes	2006-Pan100000201	Invoice	20/12/2006	23/03/2007	106.00	106.00
Yes	2006-Pan100000202	Invoice	20/12/2006	23/03/2007	106.00	106.00
Yes	2007-Pan1000000004	Invoice	05/01/2007	08/04/2007	53.00	53.00
Yes	2007-0CFRAC200000017	Invoice	26/01/2007	29/04/2007	173.90	173.90
Yes	2007-Customer0000000271	Invoice	07/02/2007	11/05/2007	2,352.00	2,352.00
Yes	2007-888C100000157	Invoice	12/04/2007	14/07/2007	1,362.10	1,362.10
Yes	2007-888C100000188	Invoice	12/04/2007	14/07/2007	31.80	31.80
Yes	2007-888C100000189	Invoice	12/04/2007	14/07/2007	1,363.30	1,363.30
Yes	2007-888C1000002017	Invoice	11/05/2007	12/08/2007	12.80	12.80
No	2007-C100000062	Invoice	18/09/2007	10/10/2007	800.00	800.00
No	2007-888C1000002116	Invoice	27/09/2007	09/11/2007	100.00	100.00
No	2007-888C100000214	Invoice	27/09/2007	09/11/2007	100.00	100.00
No	2007-888C100000090	Invoice	09/08/2007	10/11/2007	1,070.00	1,070.00
No	2007-888C100000213	Invoice	27/09/2007	29/12/2007	100.00	100.00
Open Amount by Currency : USD					8,156.90	8,156.90

Date: 27/9/2007

ABC Company
150 JFK Parkway
07960 Morrisown
United States of America

Dutley Office
Waterfront Business Park
Waterfront West
JingMae Tower
D15 1LK Birley Hill
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Phone: 5922301
Fax: 5922302-3456
Email: jao@qad.com

Dear Sir or Madam,

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Yours faithfully

Mike Taylor
Credit Controller
9662201

Overdue	Voucher	Type	Creation Date	Due Date	Trans Type	Invoice Amt	Open Balance
Yes	20071004-SANK-06	Prepayments	30/01/2007	03/05/2007		-2,713.00	-2,713.00
No	20071004-061000118	Invoice	29/09/2007	29/12/2007	License	4,952.00	4,952.00
Open Amount by Currency : EUR						1,239.00	1,239.00
Yes	2006-Pan1108	Invoice	29/11/2006	02/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1180	Invoice	30/11/2006	03/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1184	Invoice	04/12/2006	07/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1193	Invoice	04/12/2006	07/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1191	Invoice	04/12/2006	07/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1195	Invoice	05/12/2006	08/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1196	Invoice	05/12/2006	08/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1197	Invoice	05/12/2006	08/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1198	Invoice	05/12/2006	08/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1083	Invoice	20/12/2006	23/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1201	Invoice	20/12/2006	23/03/2007	Spare Parts	106.00	106.00
Yes	2006-Pan1202	Invoice	20/12/2006	23/03/2007	Spare Parts	106.00	106.00
Yes	2007-Pan114	Invoice	05/01/2007	08/04/2007	Fin Charge	53.00	53.00
Yes	2007-0CFRAC217	Invoice	26/01/2007	29/04/2007	Expenses	173.90	173.90
Yes	2007-Customer171	Invoice	07/02/2007	11/05/2007	License	2,352.00	2,352.00
Yes	2007-888C1157	Invoice	12/04/2007	14/07/2007	Services	1,362.10	1,362.10
Yes	2007-888C1158	Invoice	12/04/2007	14/07/2007	Expenses	31.80	31.80
Yes	2007-888C1159	Invoice	12/04/2007	14/07/2007	Services	1,363.30	1,363.30
Yes	2007-888C1317	Invoice	11/05/2007	12/08/2007	Fin Charge	12.80	12.80
No	2007-CH82	Invoice	18/09/2007	10/10/2007	License	800.00	800.00
No	2007-888C1716	Invoice	27/09/2007	09/11/2007	Expenses	100.00	100.00
No	2007-888C1714	Invoice	27/09/2007	09/11/2007	Expenses	100.00	100.00
No	2007-888C1590	Invoice	09/08/2007	10/11/2007	Services	1,070.00	1,070.00
No	2007-888C1718	Invoice	27/09/2007	29/12/2007	Expenses	100.00	100.00
Open Amount by Currency : USD						8,156.90	8,156.90

QAD Proprietary

Report Layout Customization Example 3

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Our Passion. Your Advantage.

BEFORE

Statement of Account

Date: 27/9/2007

ABC Company
150 JFK Parkway
07960 Morristown
United States of America

Dusley Office
Waterfront Business Park
Waterfront West
JingMao Tower
DYS 1LX Briarley Hill
Belgium Baidlands
Phone: 56223301
Fax: 5622332-3456
Email: jwo@qad.com

Dear Sir or Madam,

Your account now shows the following list of open items. If there are any discrepancies please inform us.

Yours faithfully

Mike Taylor
Credit Controller
56223301

Overdue	Voucher	Type	Creation Date	Due Date	Invoice Amt	Open Balance
Yes	2007/KOH-BANK/0000000056	Prepayments	30/6/2007	03/06/2007	-2,713.00	-2,713.00
No	2007/QADDB1000000015	Invoices	25/09/2007	29/12/2007	4,000.00	4,000.00
Open Amount by Currency - EUR					1,287.00	1,287.00

AFTER

Statement of Account

Date: 27/9/2007

ABC Company
150 JFK Parkway
07960 Morristown
United States of America

Dusley Office
Waterfront Business Park
Waterfront West
JingMao Tower
DYS 1LX Briarley Hill
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Credit Controller
56223301

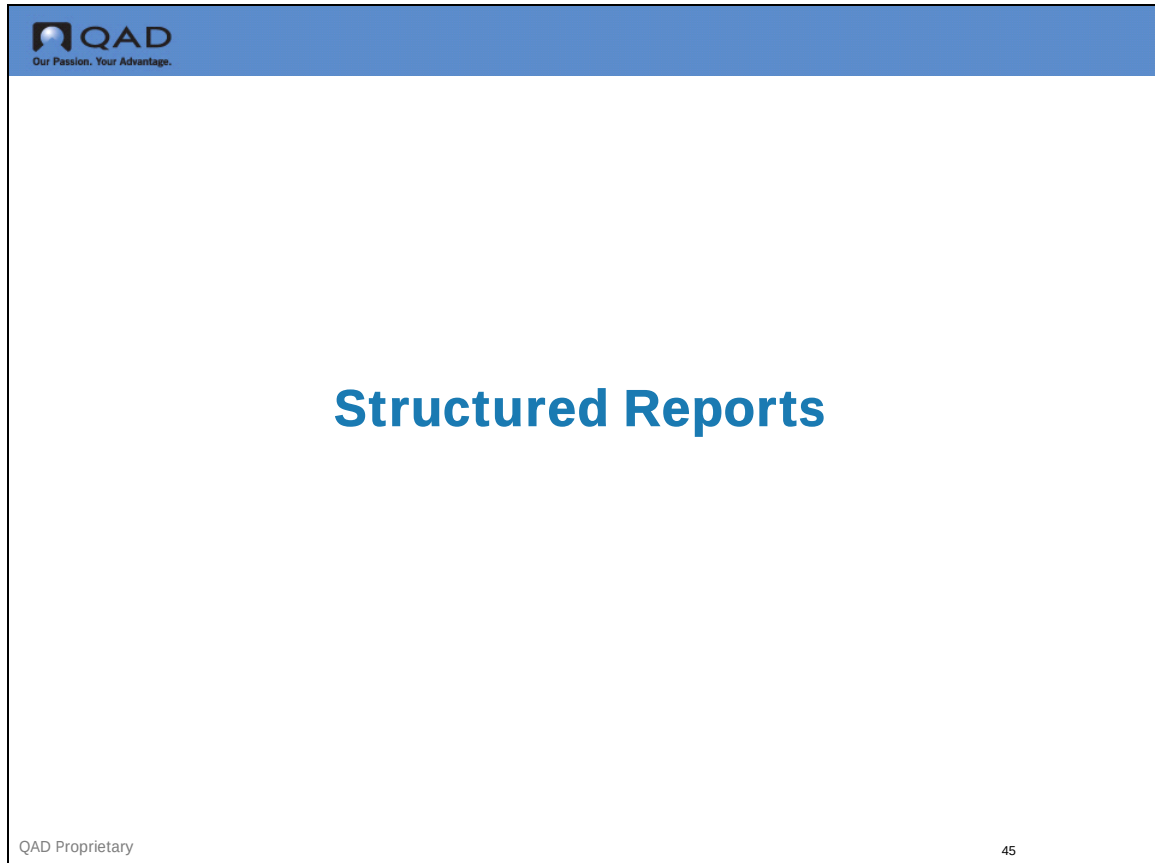
Overdue	Voucher	Type	Creation Date	Due Date	Trans Type	Invoice Amt	Open Balance
Yes	2007/KOH-BANK/0000000056	Prepayments	30/6/2007	03/06/2007		-2,713.00	-2,713.00
No	2007/QADDB1000000015	Invoices	25/09/2007	29/12/2007	License	4,000.00	4,000.00
Open Amount by Currency - EUR						1,287.00	1,287.00

Annotations:

- Added logo
- Swapped address boxes
- Suppressed leading zero's
- Changed color
- Added column

QAD Proprietary

Structured Reports



Structured Reports 2



Structured Reports

- ▲ A tool to report on Accounting data where
 - The topics to report on are defined by the user (the report structure)
 - The column data can be Actual and Budget data
- ▲ A structured report run =
 - a Report Structure
 - + an Execution Program
- ▲ Together with output management solution a replacement for Format Positions and GL Report Writer

Report Structure



Report Structure

- ▲ The report structure defines
 - The information to be reported on
 - The aggregation of this data
- ▲ Report structure definition
 - Creation
 - Linking to the Chart of Accounts
 - Entering Budget data
 - Sharing

Structure Creation



Structure creation

- ▲ Structure definition reuses budget definition logic
- ▲ Header
 - Code
 - Description
 - 'Use as Report' check-box

Budget - Modify

Budget Code	Balance Sheet	Status	Valid
Description	Balance Sheet	Used for Allocation	☐
		Use as Report	☒

Structure Creation 2



Structure creation

▲ Period tab

- Define the periods as required by the budget definition
- If no budget data is available, a 'dummy' period has to be defined

Period Code	Start Date	End Date
Quarter 2007/01	01/01/2007	03/31/2007
Quarter 2007/02	04/01/2007	06/30/2007
Quarter 2007/03	07/01/2007	09/30/2007
Quarter 2007/04	10/01/2007	12/31/2007

☐ Select Year ☒ Select Custom Date

Periods By Year
Year:

Periods by Dates
Starting Date:
Occurrences:
Budget Period Type:

Structure Creation 3



Structure creation

▲ Levels tab

- Top – down definition of a tree structure
- Level type can be
 - (sub) Total
 - All COA elements, except SAF's

General	Budget Period	Levels	Structures	Versions
WBS Level	COA Element	Used for Pr		
1	(Sub)Total			
2	(Sub)Total			
3	General Ledger			

Structure Creation 4



Structure creation

▲ Levels tab

- Strict sequence :
 - [Sub-total ... Sub-total]
 - GL Account
 - [Sub-Account]
 - [Cost Center / Project]
- This sequence is only validated when 'Use as Report' is checked
- The maximum number of levels is 8

GL Report Writer



GL Report Writer

- ▲ GL Report Writer is available as of QAD 2008.1 EE
 - With limitations !
 - Only to serve converting customers that have currently extensive use of GLRW. Not for newly implementing customers.
- ▲ Not shipped with standard product
 - To be requested and installed separately
- ▲ Does NOT take advantage of any of the new concepts in Enterprise Financials
 - Layers, MC, SAF's, ...
 - Budgets are based on the 'Standard Financials' budgets

QAD Proprietary

Daemons



Next :

DAEMONS



QAD Proprietary

Daemons 2



Daemons

- ▲ Server Based processes that allow for the tasks to be run in the background
 - The users have no direct interaction with daemons
 - Some daemons need to be running to ensure the health of QAD Enterprise Financials
 - Tasks are stored in a queue for each daemon
 - Daemon uses a polling mechanism to detect, and process, new tasks
 - The behaviour of each demon is controlled by maintenance program

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Daemons Overview



Daemons overview

- ▲ History => historical data GL & SAF
- ▲ Balance => Customer/Supplier balances & movements and history data
- ▲ Budget => actuals vs budget data
- ▲ Event => QAD Events
- ▲ Cross Company => postings
- ▲ Replication => creation of new domain
- ▲ Time Out => terminate inactive user sessions
- ▲ XML => upload of data
- ▲ Scan => documents

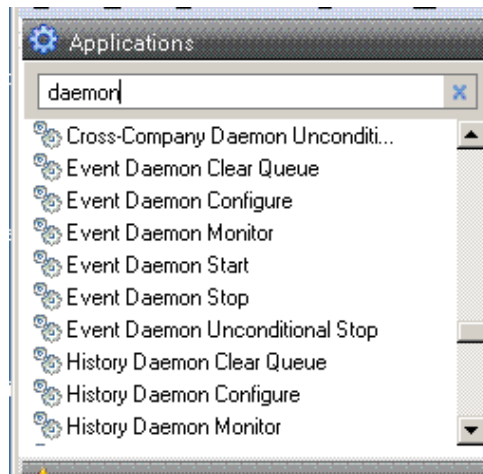
QAD Proprietary

Daemons UI Programs



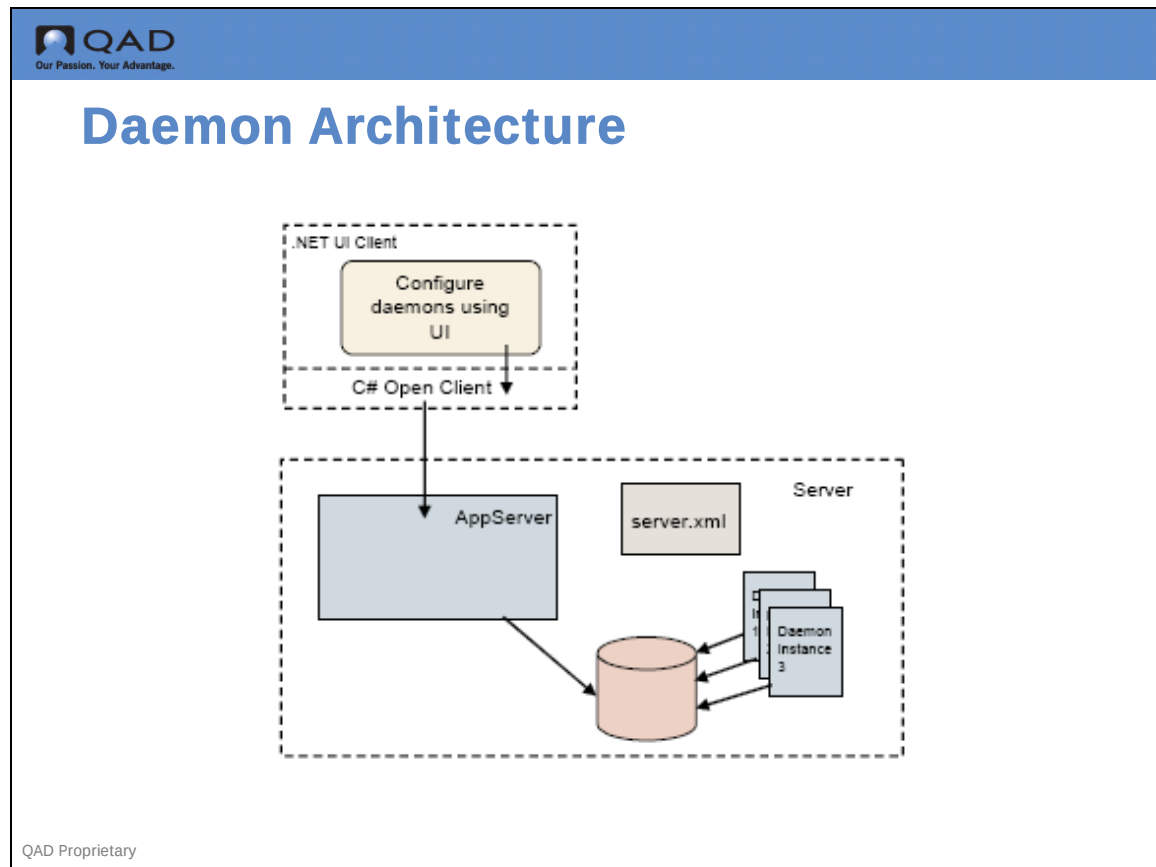
Daemons UI programs

- ▲ For each Daemon
 - Clear Queue
 - Configure
 - Monitor
 - Start
 - Stop
 - Unconditional Stop



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Daemon Architecture

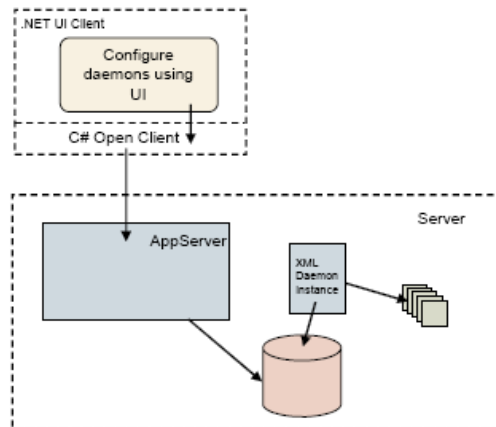


Daemon Example



Daemon Detailed Example – XML Daemon

- ▲ Processes external XML data
 - Files are stored in a directory, and the daemon detects, reads and processes them



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XML Daemon



XML Daemon

- ▲ XML Daemon configure (36.14.16.6.1)
- ▲ XML Daemon monitor (36.14.16.6.3)
- ▲ XML Daemon start (36.14.16.6.4)
- ▲ XML Daemon stop (36.14.16.6.5)
- ▲ XML Daemon unconditional stop (36.14.16.6.6)

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XML Daemon Example Usage



XML daemon (US) Example Usage

- ▲ Use the XML daemon to upload the following exchange rates (type = accounting) for USD against EUR in entity US-WEST:
 - 1 USD = 0.67 EUR as of March 1, 2008
 - 1 USD = 0.625 EUR as of April 1, 2008
 - Use the XML file USD2EURexchrates.xml

QAD Proprietary

Reporting Daemon



Installing the Reporting Daemon

REPORTING DAEMON



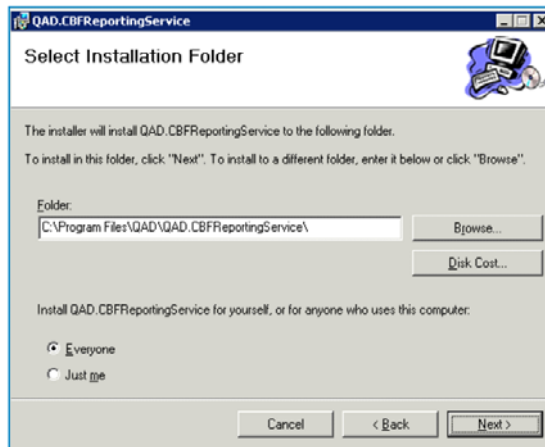
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Installing the Reporting Daemon



Installing the Reporting Daemon

- ▲ Pre-Requisite : Crystal Reports Runtime
 - Version 11+ installed on Windows
- ▲ Install the CBFReportingService MSI file



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Update Configuration File



Update Configuration File

▲ QAD.CBFReportingService.exe.config

```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>
  <configSections>
    <section name="qad.appserver" type="QAD.AppServer.ASConfigHandler, QAD.AppServer" />
  </configSections>
  <qad.appserver url="appserver://plli28:5167/build57_fin_AS" />
  <appSettings>
    <!-- An HTTP URI to a server that provides backend services for the application. -->
    <add key="homeserver" value="http://plli28.qad.com:8570/testpwx93uiapp57_qa" />
    <!-- An HTTP URI to a configuration server or a file URI referencing an XML configuration document. -->
    <add key="config.uri" value="{homeserver}/servlet/env" />
    <add key="environment" value="devwht93ui" />
    <add key="SMTPServer" value="comx01.qad.com" />
    <add key="ReportFolder" value="C:\Program Files\QAD\QAD Applications 0.57.0.0_plli28\reports" />
    <!-- the next value is in seconds -->
    <add key="DaemonCheckInterval" value="60" />
    <add key="TCPPort" value="4331" />
    <add key="LoginUsr" value="mfg" />
    <add key="LoginPasswd" value="" />
    <add key="ExternalHostName" value="" />
  </appSettings>
</configuration>
```

QAD Proprietary

Update Configuration File 2



Update Configuration File

▲ QAD.CBFReportingService.exe.config

Set **qad.appserver url**=Financials Application Server URL

```
qad.appserver url="appserver://<host>:<NameServerPort>/<Financials App Server Name>"
```

Set the value of the **key="homeserver"** to the HomeServer address

```
value=http://<host>.qad.com:<NameServerPort>/<MFGPro App Server>
```

Set the value of the **key="ReportFolder"** to a folder on the Windows server that exists.

```
value="C:\Program Files\QAD\reports"
```

Set the value of the **key="TCPPort"** to a port number the reporting service will run on.

```
value="4331".
```

QAD Proprietary

Register Daemon Service



Register Daemon Service

Register the Service so it appears in the Windows Services File.

Open up a command prompt.

Cd to the installation directory (eg cd c:\Program Files\QAD\QAD.CBFReportingService).

Execute:

```
QAD.CBFReportingService.exe -installservice -servicename report.<build>.<server> -configfile  
QAD.CBFReportingService.exe.config
```

Update user the service runs as Administrator.

By default the service is installed to run as a local user which does not have any Network Access so the service needs to be configured to run with a user that has network access.

Open Services and you should see the service report.<build>.<server>.

Right click on the Service and click on Properties.

Click on the Log On tab

Select "This account" and pick Administrator and fill in the Password. Click Ok to confirm.



QAD Proprietary

Reporting Daemon Monitor



Reporting Daemon Configure


Our Passion. Your Advantage.

Reporting Daemon Configure

Report Daemon Configure

Go To Actions Tools Print Preview

Attachments

Daemon Name	REPORTDAEMON	Last Start Date	11/25/2008 21:38:17
# Instances	1	Last End Date	11/25/2008 21:34:51
Interval (Sec)	10	Daemon Status	Running
Keep Processed Items	☒	Running Processes	1
Number Treated in One Run	999,999		
Login ID for this Daemon	mfg		
Password for this Daemon			
Daemon Log File	/dr01/eb3/daemons/b57/logs/REPORTDAEMON.log		
Daemon Start Directory	/dr01/eb3/daemons/b57/REPORTDAEMON		
OS Command String	<DaemonExecutable>		
Appserver URL			

QAD Proprietary

Reporting Daemon Activate and Test



Reporting Daemon Activate and Test

▲ Start Service

The screenshot shows the Windows Services console for 'Services (Local)'. The service 'report.build57.plli28' is selected and highlighted in blue. To the left of the service name, there are links for 'Stop the service' and 'Restart the service'. The service table below lists several other services.

Name	Description	Status	Startup Type
Remote Packet Cap...	Allows to c...		Manual
Remote Procedure ...	Serves as t...	Started	Automatic
Remote Procedure ...	Enables re...		Manual
Remote Registry	Enables re...	Started	Automatic
Removable Storage	Manages a...		Manual
report.build57.plli28		Started	Automatic
Resultant Set of Po...	Enables a ...		Manual

QAD Proprietary

Reporting Daemon Activate and Test 2



Reporting Daemon Activate and Test

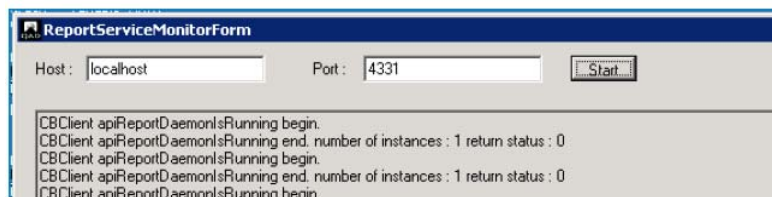
▲ Launch Monitor

C:\Program Files\QAD\QAD.CBFReportingServiceMonitor\QAD.CBFReportingServiceMonitor.exe.

Host=localhost

Port=As specified in QAD.CBFReportingService.exe.config (Default 4331).

Press Start



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Print Report


Our Passion. Your Advantage.

Print Report

▲ Choose report, fill output details, and execute

Server Output Processing 

☐ To Printer

☒ To File C:\Program Files\QAD\reports\trialbalance2008.pdf

☐ E-Mail to Addresses

To

Cc

Bcc

☐ E-Mail to Roles

To

Cc

Bcc

E-Mail Subject

Output Format Adobe Acrobat (PDF)

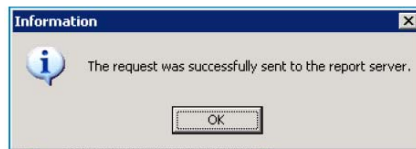
QAD Proprietary



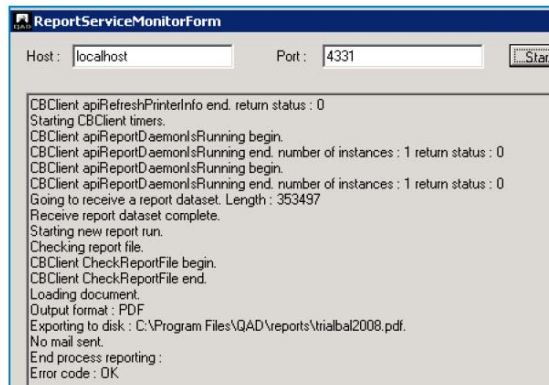
Check the Result



Check the result



Check the report monitor for any errors.



QAD Proprietary

Chapter 4

Validate and Troubleshoot

QAD Enterprise Edition

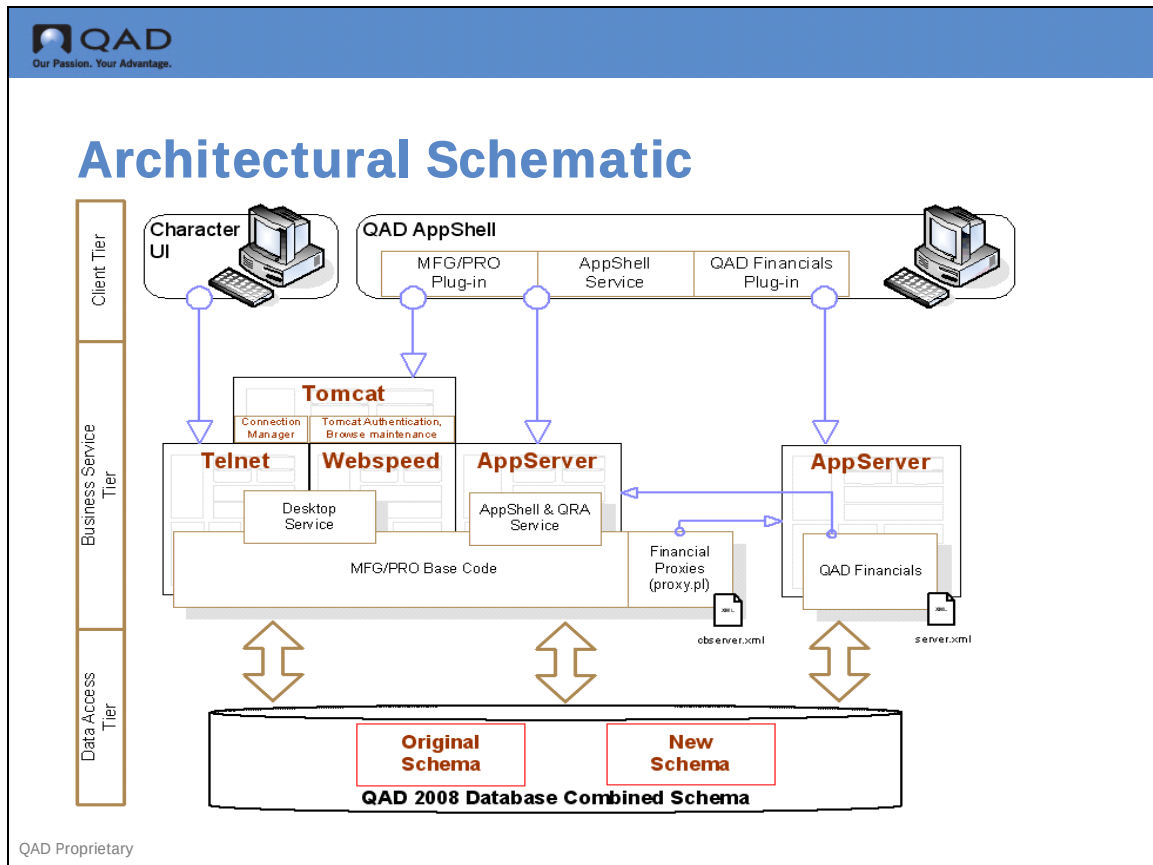


QAD Enterprise Edition

- ▲ QAD Enterprise Edition is a complete enterprise solution that provides QAD Core
 - foundation manufacturing, distribution, financials modules.
 - Sometimes known as “ERP – Enterprise Resource Planning”
- ▲ QAD Enterprise Edition also includes
 - Extensible data and security management features allowing for plug-ins to QAD’s additional solutions
- ▲ In the past, the ERP component was known as MFG/PRO and carried the brands known as eB, eB2, eB2.1, and QAD 2007

QAD Proprietary

Architectural Schematic



Validation



Next : Post Installation Tasks

VALIDATION



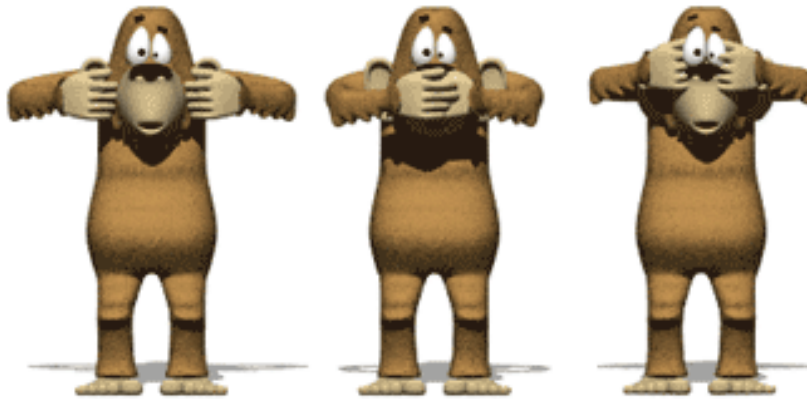
QAD Proprietary

QAD Post Installation



QAD Enterprise Edition Post-Installation

- ▲ Validating an installation
- ▲ What to do when things go wrong?
- ▲ Post-installation updates



QAD Proprietary

Concepts



Concepts

- ▲ Complex systems are unpredictable and software failures can occur
- ▲ Most failures are due to simple configuration or setup errors
 - Typing errors
 - Perhaps something was missed during the setup?
- ▲ This training material covers the most common types of failures which may occur
 - It is not an exhaustive list of what *could* go wrong
 - If you still cannot correct a problem after following the information presented, please contact QAD Support.

QAD Proprietary

Validating an Installation



Validating an Installation

- ▲ Check all log files:
 - <qdt-install>/logs (or location set at QDT Install)
 - Contains installation logs & AppServer/WebSpeed logs
 - Database logs - <product-install-dir>/db/*.lg
 - \$TOMCAT_HOME/logs/catalina.out (tomcat)
 - \$TOMCAT_HOME/webapps/qadui/WEB-INF/logs (Desktop logs)

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Validating an Installation 2



Validating an install

- ▲ Validate appserver and webspeed processes -- startup, shutdown, etc
 - Check nsman -N NS1 -q
 - Should see 3 enties

```

proenv>nsman -name NS1 -query
OpenEdge Release 10.1C03 as of Sat Jan 31 21:43:54 EST 2009

Connecting to Progress AdminServer using rmi://localhost:20931/Chimera (8280)
Searching for NS1 (8288)
Connecting to NS1 (8276)

NameServer NS1 running on Host plli26.qad.com Port 5162 Timeout 30 seconds.
Application Service          UUID                      Name                      Host
WS.qadui_WSI
    23c88154b11c24d8:25d72007:120b5b07a5e:-7fff      WS.qadui_WSI
AS.qadui_AS
    23c88154b11c24d8:-1cbe9384:120b5aff3e2:-7fff      AS.qadui_AS
AS.qadfin
    23c88154b11c24d8:63eede25:120b5af266f:-7fff      AS.qadfin
  
```

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Validating an Installation 3



Validating an install

- ▲ Ensure all startup, shutdown, and client scripts work without errors
 - <qad-install-dir>/scripts/client-<lang>.<env> - CHUI
 - <qad-install-dir>/scripts/telnet-<lang>.<env> - .NET Telnet
 - <qad-install-dir>/scripts/connmgr.<env> - Connection Mgr
- ▲ Load printer detail as it's not installed via QDT
 - If you are upgrading from a previous version of QAD
 - prd_det--load via Progress Editor if necessary
- ▲ Ensure .NET client connectivity for client
- ▲ Check each translation via .NET client per each language installed

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Validating an Installation 4



Validating an install

- ▲ Check login, menu security, domain access, etc. for each installed user
- ▲ Add new user and ensure new security is correct user--domains, menus, etc
- ▲ Test User Monitor Inquiry for login/licensing information (lvmon.p)
- ▲ Ensure browses are displayed in correct language via both character and .NET clients
- ▲ Ensure menu displays in proper languages
- ▲ Ensure field help displays in proper languages
- ▲ Ensure browses are in proper language
- ▲ Test printing via character and .NET client for each language

QAD Proprietary

Quick Connectivity Check



Quick Connectivity Check

▲ Launch CHUI Session

- `<qad-install-dir>/scripts/client-<lang>.<env>`

```
***** W E L C O M E *****
QAD Enterprise Applications 2008.1 - Enterprise Edition as of Sep 16 2008
QAD
100 Innovation Place
Santa Barbara, CA 93108

(805) 684-6614
(805) 565-4202 FAX

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Active Users:                Defined Users:

User ID: █ _____
Password: _____
Domain: _____
```

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Quick Connectivity Check 2



Quick Connectivity Check

▲ .NET UI

- Login to .NET UI - Checks qadfin<env> and qadui_AS<env> AppServers
- Launch connection manager - Checks Tomcat & Webspeed – qadui_WS<env>
- Run Sales Order Maintenance (sosomt.p) – Checks Connection Manager and script
- Launch Browse from Sales Order Maint – Checks QAD ERP AppServer – qadui_AS<env>
- Launch Help

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Quick Connectivity Check 3



Quick Connectivity Check – Cont...

▲ .NET UI

- Launch Report (User monitor report) - Check ERP Reporting
- Launch Report ("GL account data report" 25.15.1.11) – Check Financial Reporting/Crystal
- Launch Currency Modify – Check QAD Financials AppServer – qadfin<env>
- Choose a currency to modify (double click) – Checks more of Financials Plugin
- Launch User Maintenance – Modify a user name and save – Checks ERP → FIN AppServer call – i.e. cbserver.xml
- Search for Item Maintenance and switch to Telnet Mode
 - Launch – Check Telnet Script (User Option Telnet Maint) and also configuration of \$TOMCAT_HOME/webapps/qadhome/client/config/*.xml

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Troubleshooting



What to do when things go wrong ... ?



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CHUI Login Session Failed



Trouble Shooting – CHUI Login Session Failed

- ▲ Check screen error messages from Progress
 - Search Progress KB
<http://progress.atgnow.com/esprogress/categoryBrowse.do>
- ▲ Check database logs for error messages
- ▲ Might be failing to connect to Financials AppServer
 - Check <qad-inst-dir>/configs/cbserver.xml
 - Check propaths for CHUI to ensure configs directory is in the list
 - Check qadfin<env> appserver log
 - Trim appserver for qadfin<env> to 0 & try login again. If there are agents connectivity is working

```
ERROR: Application Service qadfin not found at NameServer at Host  
167.3.204.26 Port 5162. (8245). Please re-enter.
```

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.NET UI Log Failed



Trouble Shooting – .NET UI Log Failed

- ▲ Check client error messages in:
 - c:\documents and settings\[username]\application data\QAD\Shell\[version]

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.NET UI Log Failed 2



Trouble Shooting – .NET UI Log Failed

- ▲ Check AppServers and Webspeed are running
 - nsman –name NS1 –query
- ▲ Check QAD Home Config – addresses URL
 - \$TOMCAT_HOME/webapps/qadhome/client/configs/*.xml
- ▲ Check for client proxies in IE
- ▲ Check all PROPATHs
- ▲ Trim appserver for qadfin<env> to 0 and qadui_AS<env> & try login again.
 - If there are agents connectivity is working

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.NET UI Log Failed 3



Trouble Shooting – .NET UI Log Failed

- ▲ Note that .NET login will:
 - call both qadui_AS<env> and qadfin<env> appservers
 - qadfin<env> will in-turn call back to qadui_AS<env> using value in cbserver.xml
- ▲ Check server logs
- ▲ Validate .NET UI is talking to the correct QAD Home
 - c:\Program Files\QAD\QAD Enterprise Applications 2008\container\QAD.Client.exe.config
- ▲ Validate QAD Fin Plugin is talking to the correct AppServer
 - c:\Program Files\QAD\QAD Enterprise Applications 2008\plugins\qad.plugin.financials\QAD.Plugin.Financials.dll.config

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Launching Screens



Trouble Shooting – Launching Screens

- ▲ Tomcat is running?
 - Check Tomcat port with web browser



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Launching Screens 2

Trouble Shooting – Launching Screens

▲ Test the Tomcat Webapp

- Running?
- Idle Sessions?

Status	ID	Process ID	User ID	Device	User IP
Idle	2546	0	null		null
Idle	2547	0	null		null
Idle	2548	0	null		null
Idle	2549	0	null		null
Idle	2550	0	null		null
Idle	2553	0	null		null
Idle	2557	0	null		null
Idle	2562	0	null		null

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Financial Report



Trouble Shooting – Financial Report

- ▲ Ensure report files are on the client
 - C:\Program Files\QAD\QAD Enterprise Applications 2008\plugins\qad.plugin.financials\reports

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User Maintenance Save Fails



Trouble Shooting - User Maintenance Save Fails

- ▲ Probably failing to connect to Financials AppServer
 - Check `<qad-inst-dir>/configs/cbserver.xml`
 - Check propaths for CHUI to ensure config directory is in the list (`<qad-inst-dir>/scripts/connmgr.<env>`)
 - Check `qadfin<env> appserver log`
 - Trim appserver for `qadfin<env>` to 0 & try login again. If there are agents connectivity is working

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.NET Terminal Mode Fails



Trouble Shooting - .NET Terminal Mode Fails

- ▲ Check script mgusrtmt.p 36.4.14
 - Walk through script manually from the client
 - Check Authentication method in
\$TOMCAT_HOME/webapps/qadhome/client/configs/*
.xml
 - Look for ScriptUser or ShellUser
 - Script uses the user name and password from the script to login to Telnet
 - Shell users the usre name and password from the .NET UI login

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Error Reporting



Next : .NET UI Error Reporting Options

ERROR REPORTING



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Configuring Unhandled Exceptions



Configuring Unhandled Exceptions

- ▲ client-session.xml
- ▲ Default value is true

```
<Exceptions.Unhandled.Suppress>true</Exceptions.Unhandled.Suppress>
```

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Error Reports



Error Reporting

- ▲ Comprehensive diagnostic information
- ▲ HTML format
- ▲ Automatic screen shots
- ▲ Useful for development, support and testing

Error Report

[Click here to view report](#)

What were you doing when the problem happened?

Email (optional):

☒ Send screen shot

Save... Send Cancel

Error Report

General Information

description

date Friday, 10 April 2009 11:00:33

email

Stack

version 2.0.0.461

configuration test

hostname http://10.0.0.100/qad.com/8888/qad/monitor

activeWorkSpaceName Software Domain > Car USD SR newyork [500] > 5500 Test Company Primary

activeWorkSpaceKey Domain [500]

activeUser nfy

activeName Processes

activeNamePlugin qad.plugin.services

culture en-US

cultureName English (United States)

Plugins

provider	key	version	enabled	assembly
QAD	qad.plugin.browsersupportance	1.1.0	True	QAD.Plugin.Browsersupportance, Version=1.1.0.0, Culture=...
QAD	qad.plugin.publisher	1.0	True	QAD.Plugin.Publisher, Version=1.0.0.0, Culture=...

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Manually Launch Error Report

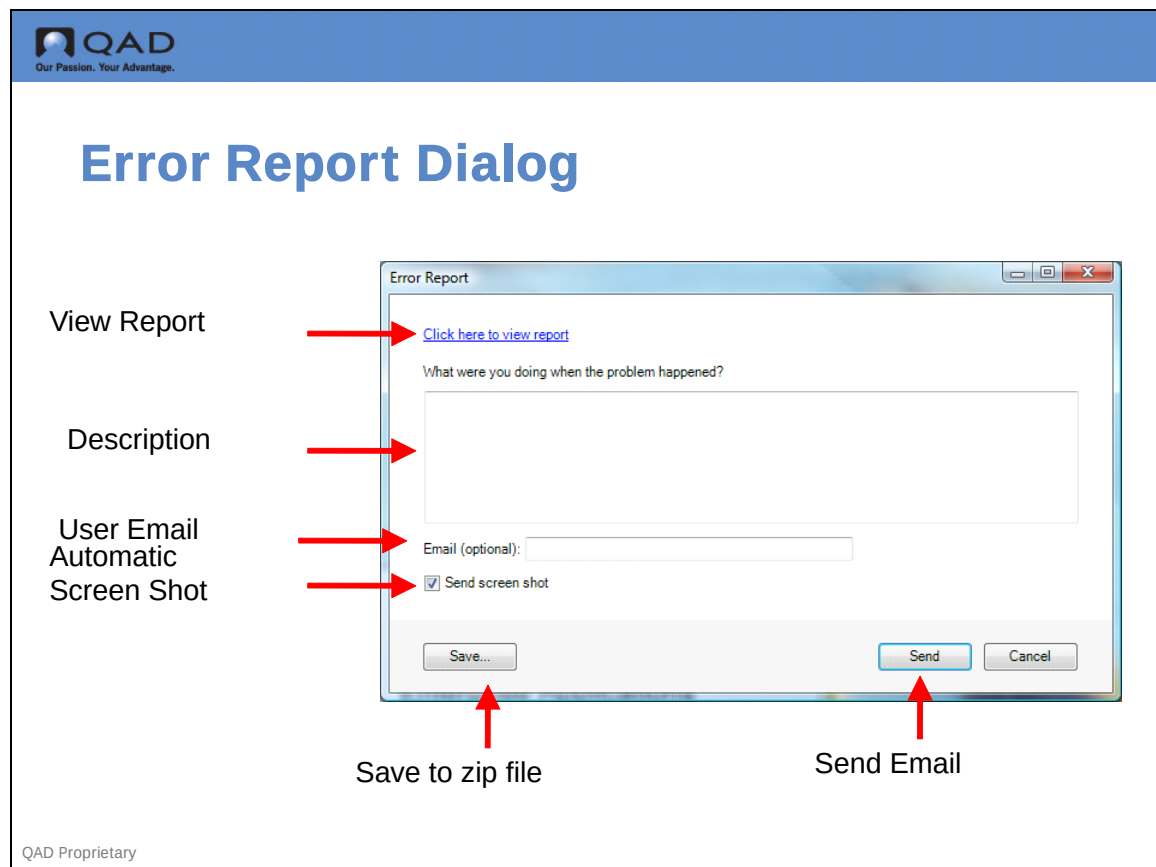


Manually Launch Error Report

- ▲ Keyboard shortcut = Ctrl + Shift + E
- ▲ Works regardless of ErrorReport.Enabled setting

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Error Report Dialog



Error Report Email



Error Report Email

- ▲ Embedded HTML report
- ▲ Zip file attachment
 - error-report-<year>-<month>-<day>.zip
- ▲ error-report.html
 - HTML version of error report
 - Generated from XML using error-report.xsl stylesheet
- ▲ error-report.xml
 - XML version of error report
- ▲ screenshot.jpg
 - Screen shot

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Error Report Extensions



Error Report Extensions

- ▲ New AppShell DiagnosticsRequested event
- ▲ Any plugin can register for this event
- ▲ XmlWriter allows any XML data to be added to the error-report file
- ▲ FileInfoCollection allows any files to be included as part of the zip file attachment

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Client Session



client-session.xml

```
<!-- Maximum number of session logs to save for error reporting -->
<ErrorReport.MaxLogs>25</ErrorReport.MaxLogs>

<!--
Enable or disable error reporting. When enabled unhandled exceptions will trigger
the error report dialog when the "Exceptions.Unhandled.Suppress" setting is false.
-->
<ErrorReport.Enabled>false</ErrorReport.Enabled>

<!-- Default error report from email address. -->
<ErrorReport.From>anonymous@qad.com</ErrorReport.From>

<!-- Error report to email address. Separate multiple email addresses with commas.
-->
<ErrorReport.To>kws@qad.com,sti@qad.com</ErrorReport.To>

<!-- Enables suppression of unhandled exception notification. Suppressed
exceptions will still be logged. -->
<Exceptions.Unhandled.Suppress>true</Exceptions.Unhandled.Suppress>
```

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Error Report Information



Error Report Information

- ▲ General – Description, Date, Email
- ▲ Shell
- ▲ Plugins
- ▲ System
- ▲ Exceptions
- ▲ Logs
- ▲ Workspaces
- ▲ Forms
- ▲ Registry
- ▲ Configurations

Error Report

General Information

description
date: Friday, 10 April 2009 11:00:22
email:

Shell

version
2.8.0.461
configuration: test
homeserver: http://col48.qad.com:8888/qadmerforce
activeWorkspaceName: Domain1 Domain 1 Curr USD DB newyork [USD] > 1000 Test Company Primary
activeWorkspaceKey: Domain1.1000
activeUser: mfg
activeForm: Processes
activeFormPlugin: qad.plugin.services
culture: en-US
cultureName: English (United States)

Plugins

provider	key	version	enabled	assembly
QAD	qad.plugin.browsenaintenance	1.1.0	True	QAD.Plugin.BrowseMaintenance, Version=2.8.0.461, Culture=neutral, PublicKeyToken=...
QAD	qad.plugin.epublisher	1.0	True	QAD.Plugin.EPublisher, Version=2.8.0.461, Culture=neutral, PublicKeyToken=...

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Error Report Troubleshooting



Error Report Troubleshooting

- ▲ Smtplib.Host and Smtplib.Port must be set to send email
- ▲ Some clients block SMTP communication
- ▲ May require client firewall permissions to send email directly
- ▲ If send fails a “Save” dialog will prompt the user to save the error report contents to a zip file

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Miscellaneous Information



Next : Miscellaneous Information

FINALLY ...



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Removing a QAD Enterprise Edition Installation



Removing a QAD Enterprise Edition Installation

- ▲ To start again from CD Image:
 - Stop all service (Tomcat, AppServers, Webspeed & DB)
 - Remove the <qad-install-dir>
 - Remove \$TOMCAT_HOME/webapps/
 - qadui
 - qadhome
 - Remove <qdt-install-dir>
 - Revert ubroker.properties to original Progress default backup is ubroker.properties-sav
 - See example script in VMImage
/dr02/scripts/remove<yyyy>

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Hotfix, Service Packs, and Releases



Hotfix, Service Packs and Releases ...

- **Hotfix**

An emergency release of code to solve a system or process halting issue. The change can be to any part of the system (db, UI or business logic) but does not contain functional enhancements. No formal media is created. AKA Patches

- **Service Pack**

An accumulation of bug fixes, including hotfixes, into a formal release where media is created. The change can be to any part of the system (db, UI or business logic). Generally no functional enhancements – but not the case at the moment.

- **Product Release**

An accumulation of bug fixes and functional enhancements into a formal release where media is created. The changes can be to any part of the system.



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Post Installation Product Updates



Post-Installation Product Updates

- ▲ Hotfixes, Service Packs (including conversions) and language installs have an automated install in QDT from SP2
- ▲ Updates will overwrite existing install
 - due to Financial plugin of .NET UI
- ▲ Languages:
 - Core languages released on QAD Enterprise Edition CD
 - Updates on a CD per language
 - Requires QAD .NET UI update after install

QAD Proprietary

Chapter 5

Database Administration

Advanced Database Administration

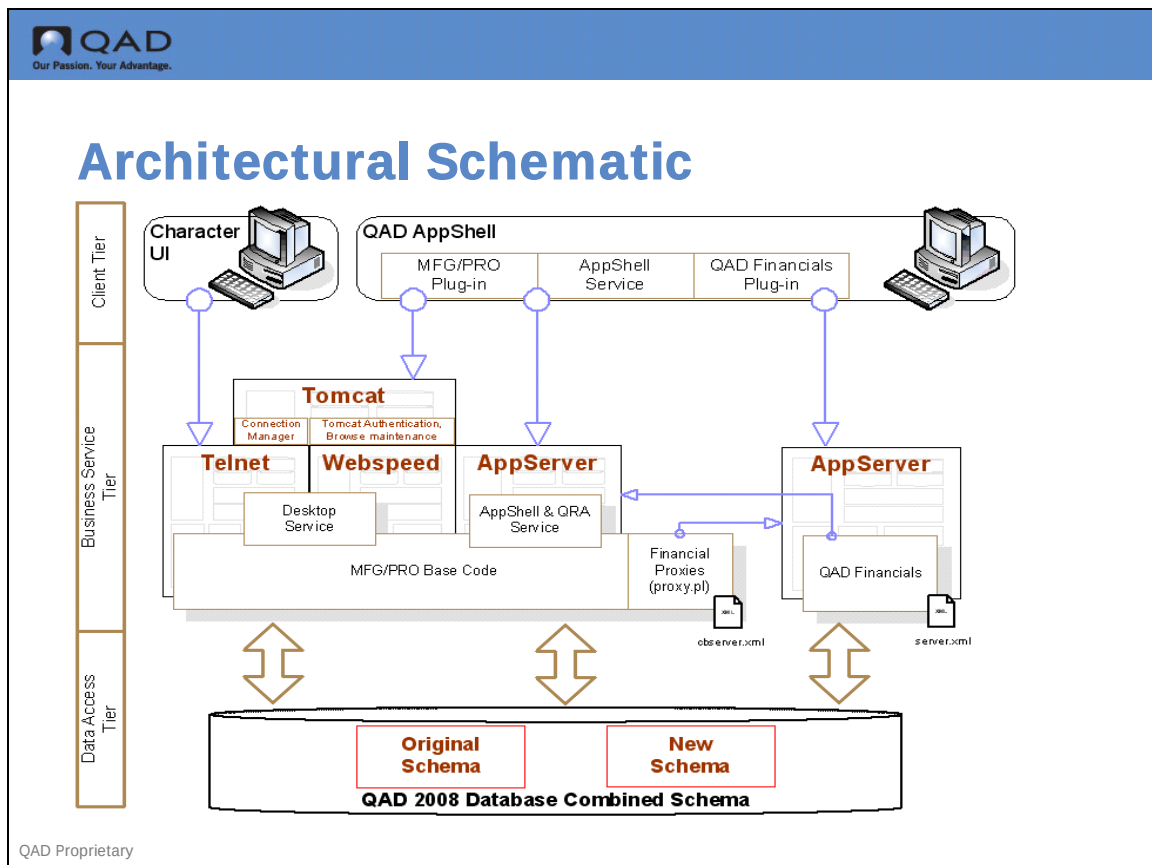


Advanced Database Administration



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Advanced Database Administration



Setting the OpenEdge Environment



Setting the Open Edge environment

- ▲ For the following slides, it is assumed the Progress Open Edge Environment is set
 - Proenv command

```
[root@p11i26 bin]# pwd
/dr01/progress/dlc101c/bin
[root@p11i26 bin]# ./proenv
```

```
    DLC: /dr01/progress/dlc101c
WRKDIR: /dr01/progress/dlc101c_wrk
```

```
Inserting /dr01/progress/dlc101c/bin to beginning of path and
the current directory is /dr01/progress/dlc101c_wrk.
```

```
OpenEdge Release 10.1C03 as of Sat Jan 31 21:43:54 EST 2009
```

```
proenv> █
```

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Database Reorganization



Database Reorganization

- ▲ Once a database has been created, it must be maintained
 - This may include reorganization

- ▲ A database may need to be reorganized for many reasons
 - Disk space constraints
 - Performance
 - Schema changes
 - Planned Maintenance
 - Planning for database growth
 - Emergency maintenance
 - About to hit an internal limitation
 - Database error messages

QAD Proprietary

Introduction to prostrct



Introduction to prostrct

- ▲ The OpenEdge Structure utility
 - A tool for database reorganization
 - Essential for running a high availability system
- ▲ Syntax
 - prostrct *db-name* [option]
 - Important [option]s
 - statistics
 - list
 - create
 - add
 - add online
 - remove
 - repair

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prostrct statistics



prostrct statistics

Shows:

- The database name
- The primary database block size and the before-image and after-image block sizes
- The storage area and each extent within it
- The total number of active blocks allocated for each data area
- The total number of empty blocks in each data area
- The total number of extent blocks for each data area
- The total number of blocks for each data area
- The total records per block for each data area
- The total number of all blocks (active, data, free, empty, extent, and total blocks)
- The date and time of the last full database backup

Running prostrct statistics against an online database gives you a snapshot of the database state at that moment in time.

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prostrct statistics 2



Our Passion. Your Advantage.

prostrct statistics

```

proenv>prostrct statistics mfgprod | more
Warning: another user is using this database in update mode.
Accessing the database with -RO may give unexpected results. (1531)
WARNING: Before-image file of database mfgprod is not truncated. (1552)
[Warning] database in use - reported statistics are approximations. (12567)

Storage Utilization Statistics

Database: mfgprod

Primary data block size: 8192
      BI block size: 16384
      AI block size: 8192

Database Physical structure information

Statistics for Area: HISTORY

Files in Area: HISTORY
/dr02/QAD2008.1EE/db/mfgprod_11.d1 2147483648
/dr02/QAD2008.1EE/db/mfgprod_11.d2 2147483648
/dr02/QAD2008.1EE/db/mfgprod_11.d3 2147483648
/dr02/QAD2008.1EE/db/mfgprod_11.d4 2147483648
/dr02/QAD2008.1EE/db/mfgprod_11.d5 2147483648
/dr02/QAD2008.1EE/db/mfgprod_11.d6 1603665920

Database Block Usage for Area: HISTORY

Active blocks: 1506469
Data blocks: 1506469
Free blocks: 0
Empty blocks: 11
Total blocks: 1506480
Extent blocks: 6
Records/Block: 64
Cluster size: 1

Database Block Usage Summary

Active blocks: 11995234
Data blocks: 11994594
Free blocks: 640
Empty blocks: 62238
Extent blocks: 100
Total blocks: 12057472

Last full database backup on Thu Apr 9 19:10:59 2009.

```

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prostrct list



prostrct list

- ▲ prostrct list documents the internal database structure
 - The internal database structure and the structure file (dbname.st) are not automatically in sync
 - Any time a change is made to the database, the structure file should be updated to reflect this
- ▲ prostrct list produces a structure file by interrogating the DB control area
 - Syntax : prostrct list *db-name* [optional structure file output]

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prostrct list 2



prostrct list

```
proenv>prostrct list mfgprod mfgprod.st | more
Area Name: Control Area, Type 6, Block Size 8192, Extents 1, Records/Block 64, Cluster Size 1
Ext # 1, Type VARIABLE, Size 640 KByte, Name: /dr02/QAD2008.1EE/db/mfgprod.db

Area Name: Primary Recovery Area, Type 3, Block Size 8192, Extents 1
Ext # 1, Type VARIABLE, Size 65792 KByte, Name: /dr02/QAD2008.1EE/db/mfgprod.b1
```

```
proenv>more mfgprod.st
#
b /dr02/QAD2008.1EE/db/mfgprod.b1
#
d "Schema Area":6,64;1 /dr02/QAD2008.1EE/db/mfgprod.d1
#
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d1 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d2 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d3 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d4 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d5 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d6 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d7 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d8 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d9 f 2097152
d "TRANSACTION":7,64;1 /dr02/QAD2008.1EE/db/mfgprod_7.d10
#
d "TRANSACTION_IDX":8,32;1 /dr02/QAD2008.1EE/db/mfgprod_8.d1 f 2097152
d "TRANSACTION_IDX":8,32;1 /dr02/QAD2008.1EE/db/mfgprod_8.d2 f 2097152
d "TRANSACTION_IDX":8,32;1 /dr02/QAD2008.1EE/db/mfgprod_8.d3
```

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prostrct add



prostrct add

- ▲ Adds storage areas to an existing database
- ▲ Backup!
 - Create a new structure file


```
# add.st
#
d "new",128 . f 2048
d "new" .
```
 - `#prostrct add db-name add.st`

```
Formatting extents :
Size      area name
2048      New      /dr01/eb3/db/new_9.d1 0:03
32        New      /dr01/eb3/db/new_9.d1 0:01
```
 - The new extents are added
 - Remember to use `prostrct list` to update the structure file

```
# add.st
#
d "new",128 . f 2048
d "new" .
```

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prostrct add online



prostrct add online

- ▲ Online version of prostrct add
 - Only one instance at a time
 - Checks users have privileges to access new extents
 - Creates extents
 - Rechecks user privileges
 - Locks admin area
 - Adds extents
 - Unlocks admin area

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Additional prostrct add Information



prostrct add – Additional Information

- ▲ Use –validate to check the structure file
- ▲ If you do not assign area numbers, prostrct auto assigns them
 - Sequentially from area 7
- ▲ Trim unused area memory
 - If you know you will never need to add areas beyond the current maximum, you can trim the unused area space via a database startup parameter
 - -maxarea
 - Defaults to 32000 if not specified

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prostrct remove



prostrct remove

- ▲ Removes extents
- ▲ First, you must truncate the before-image file
`#proutil db-name -C truncate bi`
- ▲ And disable after-imaging
- ▲ Then you can remove extents
`#prostrct remove db-name extent-type [area-name]`

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prostrct repair



prostrct repair

- ▲ Used to fix a corrupted database master block
- ▲ Also very useful for moving the database files to new locations
 - Ensure the structure file is up to date (prostrct list)
 - Shut down the database
 - Backup!
- ▲ Move the physical database file extents using the operating system

```
proenv>prostrct list admempty admempty.st
```

```
proenv>ls admempty*
admempty_10.d1  admempty_11.d2  admempty_8.d1  admempty_9.d2  admempty.db  admempty.st
admempty_10.d2  admempty_7.d1   admempty_8.d2  admempty.b1    admempty.df  admempty.tpl
admempty_11.d1  admempty_7.d2   admempty_9.d1  admempty.d1    admempty.lg
proenv>mkdir new
proenv>mv admempty_7.d1 new
```

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prostrct repair 2



prostrct repair

- ▲ Update the structure file to reflect the changes
- ▲ #prostrct repair *db-name structure-file-name*
- ▲ Restart database

```
#
b /dr02/QAD2008.1EE/db/admemory.b1
#
d "Schema Area":6,64;1 /dr02/QAD2008.1EE/db/admemory.d1
#
d "GUI":7,64;1 /dr02/QAD2008.1EE/db/new/admemory_7.d1 f 128
```

```
proenv>prostrct repair admemory
Prostrct repair of database admemory using structure file admemory.st completed.
```

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Moving Tables



Moving Tables

```
proutil db-name -C tablemove [owner-name.] table-name table-area  
[ index-area ]
```

- ▲ Move a table and associated indexes from one storage area to another, while database remains online
 - If you omit the index area, then the associated indexes will not be moved
 - The table is exclusively locked
 - A transaction is logged to the BI area
 - The BI area is required to be at least three times larger than the combined size of the table and its indexes

QAD Proprietary

Moving Indexes



Moving Indexes

```
proutil db-name -C idxmove [owner-name.] indexname area-name
```

- ▲ Moves an index from one storage area to another, while database remains online
 - Whilst the new index is being built, the old index remains active
 - The old index is then removed, and all blocks transferred to the new index. This can take a long time, and users using the index may suffer an application freeze.
 - _UserStatus virtual system table shows move progress

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Compacting Indexes



Compacting Indexes

```
proutil db-name -C idxcompact [ owner-name. ] table-name.index-name [ n ]
```

- ▲ Index compaction increases index block space utilization and the number of blocks in the B-tree
 - Deleted Index entries are removed
 - Possibly reduces the number of B-tree levels
 - Increases performance
 - Use proutil *db-name* -C dbanalys
 - If Index space utilization is less than 60%, it is a good candidate for compaction
 - Full concurrency maintained ... Only 1 to 3 index blocks are locked at a time
 - _UserStatus virtual system table shows compaction progress

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Index Rebuild



Index Rebuild

```
proutil db-name -C idxbuild
[ all |
  table [owner-name.] table-name |
  area area-name | schema schema-owner |
  activeindexes | inactiveindexes ]
[ -T dir-name ] [ -SS sort-file-directory-specification ]
[ -TB blocksize ] [ -TM n ] [ -B n ] [ -SG n ]
[ -threads n ] [ -threadnum n ]
```

- ▲ Compresses index blocks
- ▲ Activates inactive indexes
- ▲ Repairs Corrupted indexes
- ▲ Required after internal codepage change
 - Ie. Converting from ISO to UTF-8 (unicode)
- ▲ Backup!!! A rebuild crash can cause corruption.
- ▲ -TM

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Index Rebuild 2



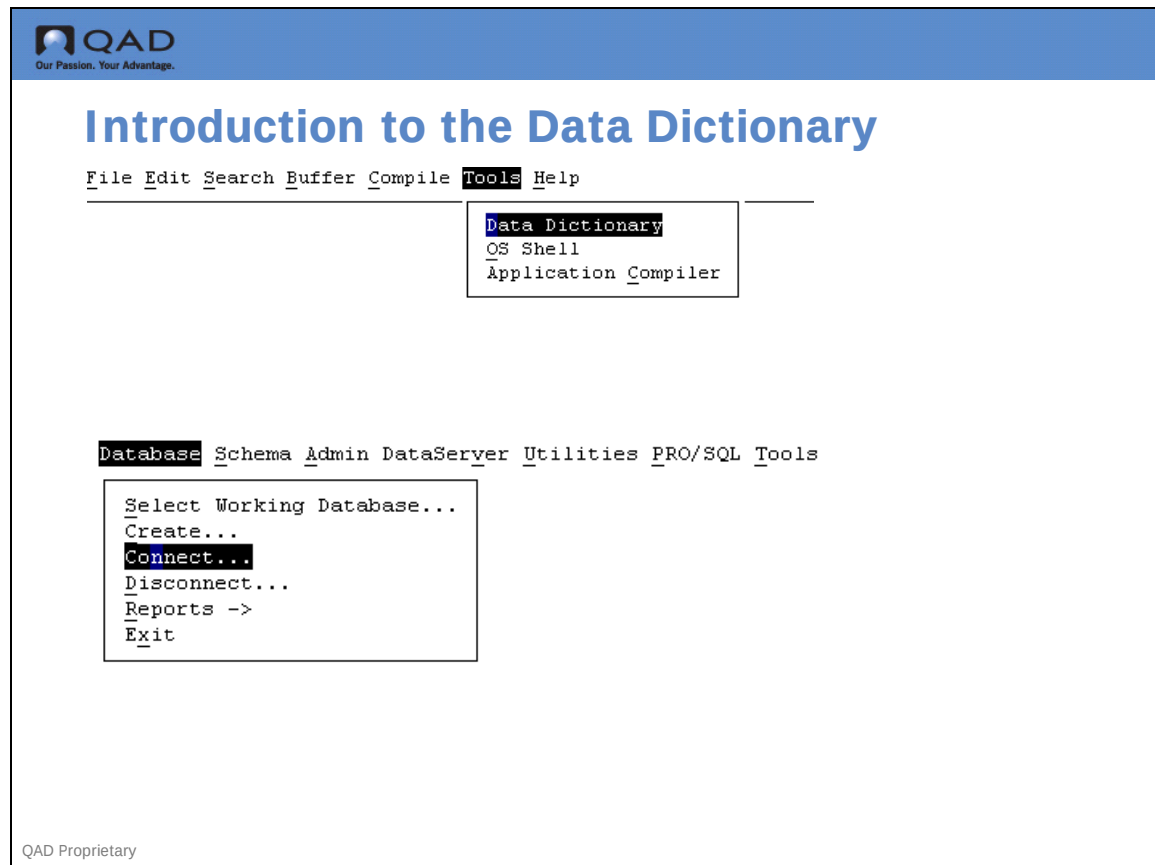
Index Rebuild – Maximizing performance

- ▲ Ensure you have 75% of the database size in disk space available
 - If space is an issue, use a sort file
 - Dbname.srt, in the database
 - directory

```
300000 /dr01/tmp
300000 /dr02/tmp
0 /dr03/tmp
```
- ▲ -TB 24 (Speed Sort Memory)
- ▲ -TM 32 (Merge Number)
- ▲ -SG 64 (Smaller sort groups)
 - Requires more file handles and system memory
- ▲ Use -T to place temporary files on another disk

QAD Proprietary

Introduction to Data Dictionary



Introduction to Data Dictionary 2



Introduction to the Data Dictionary

- ▲ General Purpose database administration tool
 - Windows and UNIX/Linux provide equivalent functionality but different interfaces
 - Easiest way to invoke is via the procedure editor
- ▲ Create / Modify databases
- ▲ Update Schema
- ▲ Dump and Reload
- ▲ Data Server and SQL tools

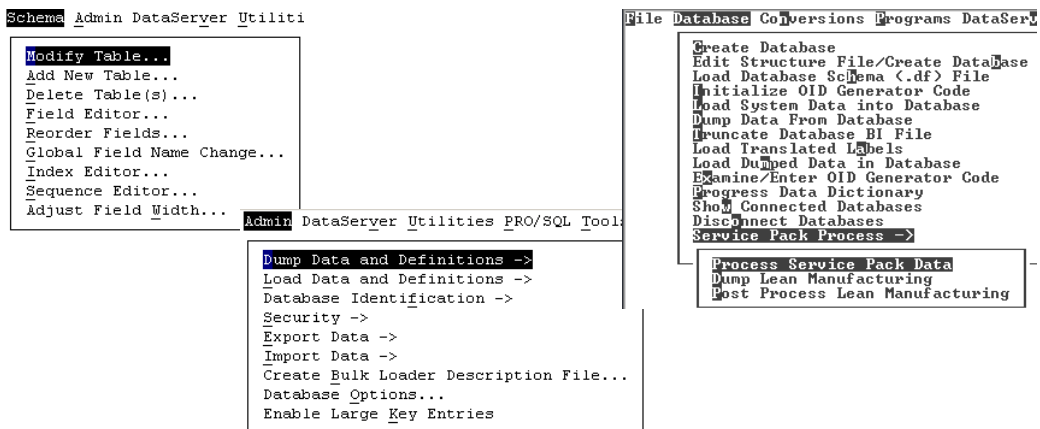
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Updating the Database Schema



Updating the database schema

- ▲ Via the Data Dictionary
 - Directly using the Schema Editor
 - Indirectly by loading a data definition file
 - Using MFG/UTIL
 - QAD often freezes the schema, and MFG/UTIL automates the process of unfreezing/changing/refreezing when it delivers a service pack



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Dump and Reload



Dump and Reload – Data Dictionary

- ▲ The simplest, slowest, way to dump and reload
 - Only recommended for small databases or tables
- ▲ Dump data as ASCII files to disk
 - [optional] Dump data definitions (.df) file
 - Dump table contents (.d) files
 - Don't forget to dump sequence current values
- ▲ Reload
 - [optional] Load data definitions
 - Load table contents (.d) files
 - Don't forget to load sequence current values
 - Indexes are updated after each record load → SLOW

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Dump and Bulk Reload



Dump and Bulk Reload

▲ Much Faster. More Complicated.

- Create Bulk Loader description file
- Dump Data (as with normal dump and reload)
- Dump Data definitions file
- Create Empty Database (with correct structure)
- Load Schema (data definitions file)
- Run Bulk Load command

```
Admin DataServer Utilities PRO/SQL Tools
Dump Data and Definitions ->
Load Data and Definitions ->
Database Identification ->
Security ->
Export Data ->
Import Data ->
Create Bulk Loader Description File...
```

```
proutil db-name [-yy n] -C bulkload fd-file [-B n]
```

where *db-name* specifies the database you are using; *-yy n* indicates the start of a 100-year period in which any two-digit DATE value is defined; *fd-file* identifies the bulk loader description file; and *-B n* indicates the Blocks in Database Buffers startup parameter; *n* specifies the number of blocks.

- ▲ Index rebuild
- ▲ To improve performance, you can run in no integrity (-i startup parameter) mode
 - Any interruption will corrupt the database
 - Restore from backup

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Other Dump and Reload Methods



Other dump and reload methods

▲ Binary Dump and Load

- Faster than data dictionary*
- Should be faster than bulkload
 - Binary load writes to the BI file, Bulkload doesn't
 - With multiple CPUs you can have multiple streams
- **proutil <db> -C dump <table> . -index 0**
 - Dump performance vs Read performance
 - Choose an index based on read order
- **proutil <db> -C load <table>.bd build**
- Rebuild Indexes

▲ Buffer Copy to a new database

- Use No Integrity for performance (-i)
- Use one thread per (virtual) processor

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Database Analysis



Database Analysis

- ▲ Good for determining fragmentation, number of records, and file sizes

```
proutil db-name -C dbanalys
```

SUMMARY FOR AREA "Inventory" : 8

NAME	Records		Indexes		Combined	
	Size	Tot %	Size	Tot %	Size	Tot %
PUB.Bin	26.3K	1.1	16.4K	0.7	42.8K	1.8
PUB.InventoryTrans	3661B	0.1	0B	0.0	3661B	0.1
PUB.Item	7662B	0.3	8117B	0.3	15779B	0.6
PUB.POLine	217.5K	9.1	51.9K	2.2	269.4K	11.3
PUB.PurchaseOrder	68.6K	2.9	19.0K	0.8	87.6K	3.7
PUB.Supplier	1177B	0.0	97B	0.0	1274B	0.1
PUB.SupplierItemXr	1118B	0.0	1166B	0.0	2284B	0.1
PUB.Warehouse	1288B	0.1	440B	0.0	1728B	0.1

Size key:

B = bytes

K = kilobytes

M = megabytes

G = gigabytes

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Index Analysis



Index Analysis

- ▲ Shows number of index blocks, and percentage of database used by index blocks

```
proutil db-name -C idxanalys
```

INDEX BLOCK SUMMARY FOR AREA "Order" : 11

Table	Index	Fields	Levels	Blocks	Size	% Util	Factor
PUB.BillTo							
custnumbillto	46	2	1	1	27B	2.7	1.0
PUB.Order							
CustOrder	48	2	2	44	39.1K	91.4	1.5
OrderDate	49	1	2	33	18.5K	57.7	2.1
OrderNum	47	1	2	38	35.3K	95.5	1.5
OrderStatus	50	1	2	7	3808B	54.6	2.1
SalesRep	51	1	2	9	6226B	69.5	1.9
PUB.OrderLine							
itemnum	23	1	2	56	36.6K	67.2	1.9
orderline	22	2	3	139	132.7K	98.2	1.0
OrderLineStatus	24	1	2	10	7354B	73.8	1.8
PUB.ShipTo							
custnumshipto	45	2	1	1	36B	3.6	1.0

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Type II Storage Areas



Type II storage Areas

- ▲ Progress claim a 30% performance improvement
 - The QAD Application performance team testing has not shown this level of results.
 - Utilities around 20% faster
 - General application use around 7% faster
 - Faster is *still* faster. 7% is a lot better than nothing.
 - QAD does not currently use type II storage areas
- ▲ A type II storage area contains data clusters (DC)
 - A DC is a set of contiguous Index (IX) or Data (RM) database blocks
 - 8, 64 or 512 blocks
 - Can only contain a specific object (ie. One table, or one index, or one LOB), implying less Fragmentation
 - Larger initial database sizes (a LOT larger)
 - Change to structure file


```
d <areaname>:<area#>,<Record/block>;<DC size> ...
```

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Backup and Recovery



Next : Backup and Recovery

BREAK



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Database Administration



Database Administration

- ▲ Backup and Recovery
 - If in doubt, back it up
 - Back it up anyway
 - Offline Backups
 - Online Backups
 - Restore
 - After Imaging
 - Fathom Replication
 - Disaster Recovery Planning
- ▲ Failed Backups have ruined careers and companies

QAD Proprietary

Backup Strategy



Create a backup strategy

- ▲ Whatever strategy you choose, make sure you test it
- ▲ Who does the backup?
 - The DBA? The Sysadmin? Whoever is last in the office?
- ▲ What does it contain?
 - Database?
 - Application?
 - Operating System?
- ▲ Where does it go?
 - Tape Drive
 - Size constraints
 - Cost
 - Network Copy
 - Portable drive
- ▲ And then where does it go?
 - Filing cabinet next to the server?
 - In a different room?
 - In a different building?
- ▲ Backup Cycling
 - How often do they get cycled (overwritten)
 - Nightly?
 - Weekly?
 - Never?
 - How are the backups labelled?

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Backup Strategy 2



What to Backup? Where do you store it?

- ▲ Backup the QAD databases daily
 - Or even twice daily
- ▲ Backup the Application once a month, or whenever it changes
- ▲ Backup the operating system once every six months, or whenever it changes
- ▲ Try to avoid storing the backups in the same building as the server
 - Even though hardware failure or user error is the most likely cause of a failed system, buildings do catch fire ...

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probkup vs. O/S Backup



probkup versus O/S Backup

- ▲ Always use probkup to back up the database
 - Probkup knows how an OpenEdge database works
 - Location of all extents
 - Before-image data
 - After-image data
 - Online backups
 - If you must use the operating system to back up a database, ensure the database is offline
 - It is still not recommended
 - The operating system can then be used to back up the resulting probkup file
 - Use probkup to backup the database to a file
 - Use the operating system to back up the resultant file

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probkup



probkup

```

probkup [ online ] db-name [ incremental ] device-name
        [ enableai ] [ enableaiarchiver -aiarcdir dirlist
        [-aiarcinterval n] [-aiarcdircrcreate]]
        [ -estimate | -vs n | -bf n | -verbose | -scan
        | -io i | -com | -red i | -norecover
        ]

```

- ▲ OpenEdge native backup
 - Offline or online
 - Use “-com” to compress the backup if you want to save space
- ▲ The database is backed up from the high water mark downward
 - Free blocks are compressed to save space
 - With the online option, all transactions started after the backup begins will not be backed up

```

proenv>probkup online mfgprod mfgprod.pbkup

11995227 active blocks out of 12057293 blocks in mfgprod will be dumped. (6686)
4096 BI blocks will be dumped. (6688)
Backup requires an estimated 91.7 GBytes of media. (9285)
Restore would require an estimated 12015656 db blocks using 11.4M of media. (9286)

```

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probkup 2



probkup

▲ Options

- -vs *n* : Break the backup into volumes of size *n*
- -bf *n* : How many blocks are buffered before output to backup device. Maximum of 1024. Performance enhancement.
- -com : Compresses backup
 - 10 to 40 % compression
- -red *I* : Sets the amount of redundancy to hold. The value *I* is a positive integer indicating the number of blocks for every error correction block. If you specify a value of 1, every block is duplicated. The default (0) means no redundancy. Use only with unreliable media
- online : Online backup

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probkup online



probkup online

- ▲ Must be used against a multi-user mode database
- ▲ Will not work in no integrity (-i) mode
- ▲ Automatically switches to a new after image extent before beginning backup
- ▲ Will not back up new transactions
- ▲ A small system-wide freeze may occur when the backup starts
 - Users not kicked out of application, but it may be unresponsive

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Quiet Points



Quiet Points

- ▲ If disk mirroring is used, database quiet points can be used to split the mirror, and backup one copy
 - #proquiet *dbname* enable
 - Split the mirror
 - #proquiet *dbname* disable
 - Update the structure file on the split mirror
 - Replace logical reference (active database) to physical reference (the mirror location)
 - prostrct repair
 - probkup *dbname* no-recover
 - Prevents switch to new AI extent, or crash recovery
 - Resync mirror

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prorest



prorest

- ▲ Restores a backup created with probkup
- ▲ Will grow the database to the required size
 - Should have a structure file in place
- ▲ Will overwrite an existing database
- ▲ #prorest *target-db backup-file*

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Tips



Tip : Warm Spares and Test Environments

- ▲ Backup online and restore is a good way of creating a test environment without kicking the users off a production system
 - probkup online
 - Then restore into a test database

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After Imaging



Next : You should be running this

AFTER IMAGING



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After Imaging 2

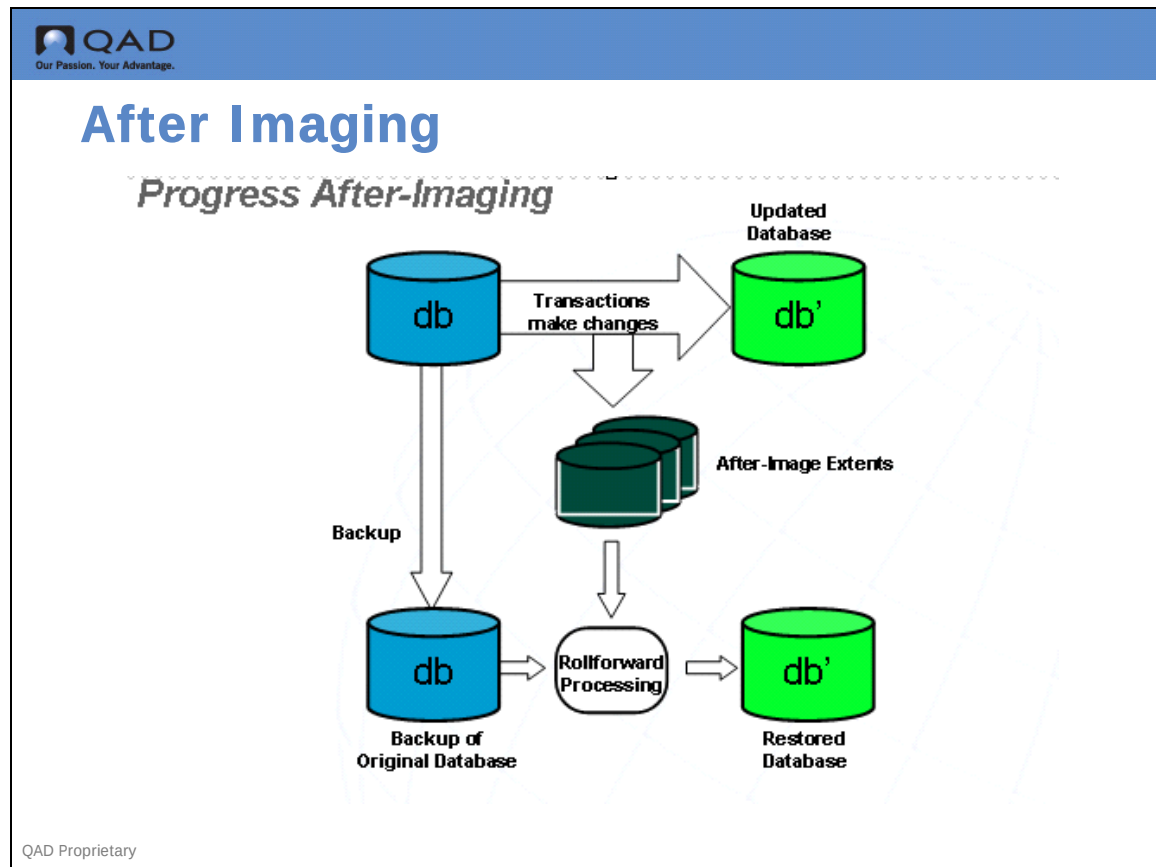


After Imaging

- ▲ After Imaging (AI) is an optional recovery system that helps guard against hardware failure
 - Provides restoration (roll forward) of transactions that occurred after most recent backup
 - Single-volume | multi-volume, Fixed-length Extents | Variable-length Extents
- ▲ Most people have realize they should have been running AI *AFTER* they fail to recover from a disaster
 - If losing data between scheduled backups would hurt your business – then you must use after imaging.

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After-Imaging 3



After-Imaging 4



After Imaging

- ▲ Calculate AI volume
 - Look at BI file activity
- ▲ Define storage and naming of AI files
- ▲ Manage AI Extents
 - rfutil <db> -C aimage new
 - os-copy <db>.aN <copy_aN>
 - rfutil <db> -C aimage empty
 - rfutil <db> -C aimage list
 - rfutil <db> -C aimage aioff
 - rfutil <db> -C aimage end
- ▲ Use after image writers (proaiw)
 - Performance

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Adding AI Extents to Database



Add AI extents to database

▲ Build a add.st file with the AI extents to add

```
a d:\aitest\aitest.a1 f 10000
a d:\aitest\aitest.a2 f 10000
a d:\aitest\aitest.a3 f 10000
a d:\aitest\aitest.a4 f 10000
a d:\aitest\aitest.a5 f 10000
```

▲ Run prostrct add <dbname> add.st

Formatting extents:

size	area name	path name
1264	After Image Area 1	d:\aitest\aitest.a1
1264	After Image Area 2	d:\aitest\aitest.a2
1264	After Image Area 3	d:\aitest\aitest.a3
1264	After Image Area 4	d:\aitest\aitest.a4
1264	After Image Area 5	d:\aitest\aitest.a5

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Enabling AI



Enabling AI

- ▲ Run rfutil <dbname> -C aimage begin
 - Automatically truncates BI file

```
D:\aitest>rfutil aitest -C aimage begin
OpenEdge Release 10.0B03 as of Thu Sep  8 09:15:50 EDT 2005
The BI file is being automatically truncated. (1526)
```

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Maintaining AI Extents



Maintaining AI extents

- ▲ Status of AI Extents
- ▲ Switching AI extents
- ▲ Archiving Full AI extent/Marking it empty
- ▲ What happens if all extents are Full
- ▲ Other

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Status of AI Extents



Status of AI extents

- ▲ AI files have three states
 - Full - extent is ready to archive
 - Busy - extent is currently being written to
 - Empty - extent is empty and ready to use
- ▲ Use `rfutil <dbname> -C aimage extent list` to see the status of AI extents

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Status of AI Extents 2



Status of AI extents

▲ Example AI extent list

```
D:\aitest>rfutil aitest -C aimage extent list  
OpenEdge Release 10.0B03 as of Thu Sep  8 09:15:50 EDT 2005
```

```
Extent:  1  
Status:  Busy  
  Type:  Fixed Length  
  Path:  d:\aitest\aitest.a1  
  Size:  10104  
  Used:  1  
  Start: Wed Apr 12 15:56:01 2000  
  Seqno: 1
```

```
Extent:  2  
Status:  Empty  
  Type:  Fixed Length  
  Path:  d:\aitest\aitest.a2
```

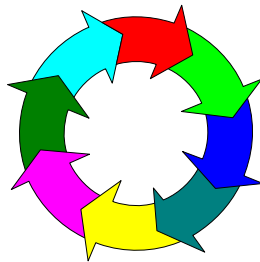
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Switching AI Extents



Switching AI extents

- ▲ As a AI file fills, it will switch to the next extent (If empty).
- ▲ Can force a switch by running
rfutil <dbname> -C aimage new



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Archiving Full Extents



Archiving Full extents

- ▲ Use a O/S copy to copy the full extent
 - `cp /ai1/mfgpro.a1 /aiarchive`
- ▲ Use `rfutil <dbname> -C aimage extent full`
 - to return the oldest full extent
- ▲ Then compress/copy to tape/rcp etc.
- ▲ Mark extent as empty
 - `rfutil <dbname> -C aimage extent empty <aifile>`

```
D:\aitest>rfutil aitest -C aimage extent empty
OpenEdge Release 10.0B03 as of Thu Sep  8 09:15:50 EDT 2005
Marked after-image extent d:\aitest\aitest.a1 EMPTY. (3789)
```

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Archiving Full Extents - UNIX



Archiving Full extents - UNIX

```
while true
do
  AIFILE=`_rfutil test1 -C aimage extent full`

  if [ -f $AIFILE ]
  then
    if cp $AIFILE oldai/test1.`date +%y%m%d-%H:%M:%S`
    then
      _rfutil test1 -C aimage extent empty $AIFILE
    fi
    sleep 1
  else
    break
  fi
done
```

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Archiving Full Extents - Windows



Archiving Full extents - Windows

```

DEF VAR AIFile AS CHAR NO-UNDO.
DEF VAR FileExt AS CHAR NO-UNDO.

DO WHILE TRUE:
  OS-COMMAND SILENT "_rfutil aitest -C aimage full > ai.tmp".

  INPUT FROM ai.tmp.

  IMPORT UNFORMATTED AIFile.

  INPUT CLOSE.

  IF search(AIFile) = ? THEN LEAVE.

  ASSIGN FileExt = SUBSTR(STRING(YEAR(TODAY),"9999"),3,2) +
                    STRING(MONTH(TODAY),"99") +
                    STRING(DAY(TODAY),"99") +
                    REPLACE(STRING(TIME,"HH:MM:SS"),":","").

  OS-COPY VALUE(AIFile) VALUE("oldai/aitest." + FileExt ).
  OS-COMMAND SILENT "_rfutil aitest -C aimage extent empty".
END.

```

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Full AI Extents



What happens if all AI extents are Full?

- ▲ By default the Broker will shut the database down
- ▲ Therefore : Start the broker with -aistall
 - All update activity is suspended
 - Message is written to database log file
 - Resumes when AI file is marked empty

**Can't switch to ai extent filename it is full.
Backup ai extent and mark it as empty (3774)**

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Checking for Empty Extents - UNIX



Checking for Empty Extents - UNIX

```
#!/usr/bin/ksh

AIEMPTY=`_rfutil test1 -C aimage list | grep "Empty" | wc -l`

if [ $AIEMPTY -lt 2 ]
then
    echo Low number of empty AI files ...
fi
```

QAD Proprietary

Checking for Empty Extents - Windows



Checking for Empty Extents - Windows

```
DEF VAR OutputLine AS CHAR NO-UNDO.  
DEF VAR EmptyAI AS INT NO-UNDO.  
  
OS-COMMAND SILENT "_rfutil aitest -C aimage extent list > ai.tmp".  
  
INPUT FROM ai.tmp.  
REPEAT:  
    IMPORT UNFORMATTED OutputLine.  
  
    IF INDEX(OutputLine,"Empty") > 0 THEN  
        ASSIGN EmptyAI = EmptyAI + 1.  
    END.  
  
IF EmptyAI < 2 THEN DO:  
    OUTPUT TO EmptyAI.LOG APPEND.  
    PUT TODAY SPACE(2)  
        STRING(TIME,"HH:MM:SS") SPACE(2)  
        "Low Number of emptys" SKIP.  
END.
```

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Best Practices



Best Practices

- ▲ Start an AIW (Enterprise DB only)
- ▲ Set -aibuffs (to $1.5 * \text{-bibuffs}$ (30-50))
- ▲ AI blocksize to be $\geq$ to the BI blocksize
rfutil <db> -C truncate ai -aiblocksize 16
- ▲ To estimate size of AI files for a day
 - # of checkpoints per day * BI cluster size

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Best Practices 2



Best Practices - Continued

- ▲ Scripts
 - Switch AI files every 15min-1hour
 - Archive AI full AI files
 - Check for low number of empty extents
- ▲ Switch just before (as a part of a backup)
 - Month/Year end process
 - Software/Hardware upgrades
- ▲ Compress AI files as a part of Archiving

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AI and Open Edge Backups



AI and Open Edge Backups

- ▲ First part of an Open Edge (probkup) online/offline backup is to switch AI extents
- ▲ Backup will fail if no empty extent exists

17:22:41 probkup session begin for Administrator on CON:. (451)
17:22:41 Begin Physical Redo Phase at 0 . (5326)
17:22:41 Physical Redo Phase Completed at blk 0 off 419 upd 0. (7161)
17:22:41 Switched to ai extent d:\aitest\aitest.a3. (3777)
17:22:41 This is after-image file number 8 since the last AIMAGE BEGIN (3778)

17:15:19 probkup session begin for Administrator on CON:. (451)
17:15:19 Begin Physical Redo Phase at 0 . (5326)
17:15:19 Physical Redo Phase Completed at blk 0 off 419 upd 0. (7161)
17:15:19 Can't switch to after-image extent d:\aitest\aitest.a3 it is full. (3775)
17:15:19 Backup ai extent and mark it as empty. (3776)

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How to Recover



How to Recover

- ▲ Restore Backup
- ▲ Apply AI files in the same order as created
 - rfutil <dbname> -C roll forward -a <aifile>
- ▲ After the last AI file is applied, the database is considered crashed.
 - Schedule a dump and reload
- ▲ Open the database (Start Broker or Single user session)
 - Normal to get crash recovery messages

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New in OpenEdge 10.1



New in Open Edge 10.1

- ▲ Extract only the blocks in the AI file that are needed (Good for coping files over a WAN)
 - `rfutil db-name -C aimage extract -a ai-extent -o output-file`
 - In progress 9.1D09 and higher
- ▲ AI File Management daemon (10.1A)
 - Broker startup
 - `-aiarcdir /usr1/aiarchives/`
 - `-aiarcinterval 3600`
 - `rfutil db-name -C aiarchiver enable`

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Create Live Empty Databases

The screenshot displays the QAD ERP configuration interface. At the top, the QAD logo and tagline 'Our Passion. Your Advantage.' are visible. The main heading is 'Create Live Empty Databases'. Below this, the 'Action' menu is open, showing options: 'Configure QAD ERP', '> Convert QAD ERP From Previous Release', 'Synchronize QAD ERP', 'Start QAD ERP', and 'Stop QAD ERP'. The 'Convert QAD ERP From Previous Release' option is selected. The 'Edit Database Properties' dialog is shown, with 'Container: Live Main Database'. The 'Database Source' is set to '(X) Other Database'. The 'Database to Copy' field contains '/dr02/TEST/QAD2008/db/mfgempty' with a '<Browse>' button. The 'New Database' field contains 'mfgprod'. The 'Logical Name' is 'qaddb', 'Service' is empty, 'Server Params' are '-L 32768 -c 350 -B 1000 -spin 50000 -tablerangesize', and 'Connect Params' are '-trig triggers'. At the bottom, navigation buttons are shown: '< Back', '>< Next >' (highlighted), '< Done', '>< Cancel >'.

QAD
Our Passion. Your Advantage.

Create Live Empty Databases

Action

- Configure QAD ERP
- > Convert QAD ERP From Previous Release
- Synchronize QAD ERP
- Start QAD ERP
- Stop QAD ERP

Edit Database Properties Container: Live Main Database

Database Source: (X) Other Database
() Progress Empty

Database to Copy: /dr02/TEST/QAD2008/db/mfgempty <Browse>

New Database: mfgprod

Logical Name: qaddb
Service:
Server Params: -L 32768 -c 350 -B 1000 -spin 50000 -tablerangesize
Connect Params: -trig triggers

< Back >< Next > < Done >< Cancel >

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Performance



Next : Performance

BREAK



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Defining Performance



What is “Performance”?

Responsiveness?



Low System Requirements?



High Capacity?



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Defining Performance 2



What is Performance?

- ▲ Performance means different things to different people
 - Usually based on their role and responsibility
 - Users and IT support are normally concerned with Application Responsiveness
 - DBAs might focus on database efficiency
 - Systems Engineers and Planners look at server capacity and utilization
 - IT managers might be concerned with user productivity, system availability, and budgets

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Typical Performance Problems



Typical Performance Problems

- ▲ Slow and unresponsive applications
- ▲ Applications get slower over time
 - Memory leaks
- ▲ Applications crash the server
 - Memory leaks
- ▲ CPU spikes and application freezes
- ▲ Applications get slower as more users login or databases get larger
- ▲ Undersized hardware

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Impact of Poor Performance



The Impact of Poor Performance



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Impact of Poor Performance 2



The Impact of Poor Performance

- ▲ Forrester Research has reported that among companies with revenue > \$100 billion, nearly 85% reported significant application performance degradation
 - Best Practices in Problem Management, June 23 2004

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Impact of Poor Performance 3



The Impact of Poor Performance

- ▲ Nearly 85% of applications are failing to meet and sustain their performance requirements over time and under increasing load



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Impact of Poor Performance 4



The Impact of Poor Performance

- ▲ Lost Productivity
- ▲ Lost Confidence and Credibility
 - Customers
 - End Users
- ▲ Lost Revenue
- ▲ Low Morale
- ▲ Financial Penalties

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Defining Poor Performance



Defining Poor Performance

- ▲ What's the Problem?
 - Regardless of the technical measurements, the performance of an application depends on *human expectations*
 - Many perceptions of poor performance could have been solved by managing the **expected performance** of the software

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Defining Poor Performance 2



Defining Poor Performance

- ▲ How do the users know something is wrong?
 - Are they having a bad day?
 - Someone is pressuring them over the phone?
 - A truck is waiting for paperwork?
 - End of Month processing?
 - The system is genuinely performing slowly?
 - Understanding *what is normal* is the key ...
 - Internal Benchmarking
 - QAD Published Benchmarks
 - Comparison over time

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Defining the Problem



Defining the Problem

- ▲ Program runs slowly
 - New version?
 - Change to environment?
 - Has it been getting slower over time?
- ▲ MFG/PRO runs slow at a certain time
 - Unbalanced workload?
 - The accountants are doing some work?
 - Batch processes (backup, MRP ...) running?
- ▲ Everything is slow, at random times
 - Can be frustrating and difficult to isolate the cause
- ▲ Everything is slow, all the time
 - Full performance audit
- ▲ Certain Interfaces run slow
 - Back to customer expectations

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Problem Solving



So there is a problem, what do we do?



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Performance Engineering Methodology



Performance Engineering Methodology

- ▲ Establish performance objectives
- ▲ Define critical requirements
- ▲ Create a Baseline
- ▲ Identify Normal and Abnormal conditions
 - Consider SLAs (Service Level Agreements) with the users
- ▲ Continuous Monitoring
- ▲ Performance Tuning
- ▲ Capacity and Sizing

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Establish Performance Objectives



Establish Performance Objectives

- ▲ Define the Requirements
 - Do the requirements change during peak periods (end of month / beginning of day)?
 - The typical mix of user processing expected
 - The total number of concurrent users, and assumed rates of work
 - Assumptions / Caveats / Mitigating Circumstances
 - Uptime / Downtime windows
- ▲ Identify the Hard requirements
 - Serious consequences if missed

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Definitions and Concepts



Some Definitions and Concepts



- ▲ Bandwidth and Capacity
 - Utilization
- ▲ Response Time
 - Queue Time
 - Service Time
 - Transmission Delay
- ▲ Throughput
- ▲ Scalability
- ▲ Bottleneck

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System Sizing Tips



System Sizing – General Tips

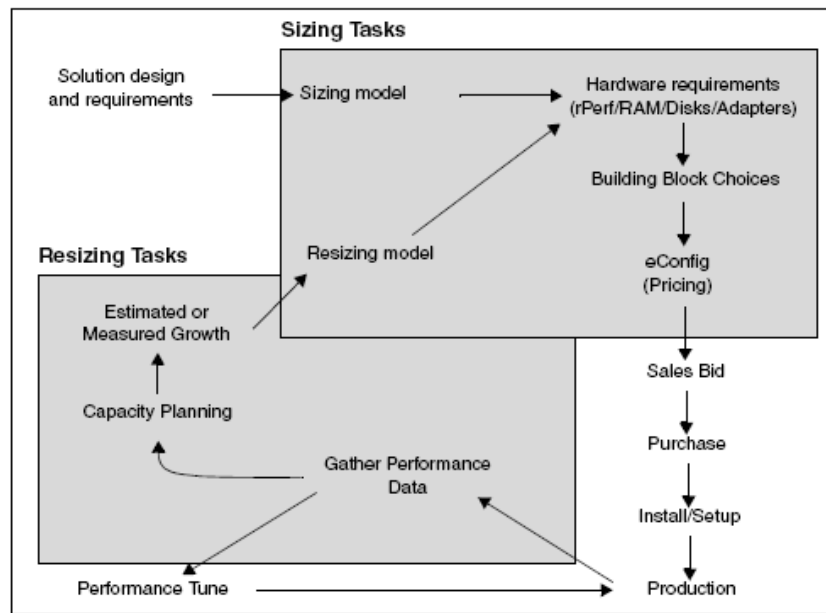
- ▲ If in doubt, contact QAD Global Technical Services
- ▲ Avoid Software Virtualization
 - Hardware virtualization like IBM's LPARs or HP's Virtual Server Environment are OK
- ▲ Sizing is *difficult*
 - Known facts are usually clouded by guesses and assumptions
 - It is trying to predict the future, with unique and often moving requirements, against a rapidly changing hardware industry

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System Sizing Tips 2



System Sizing – An Iterative Process



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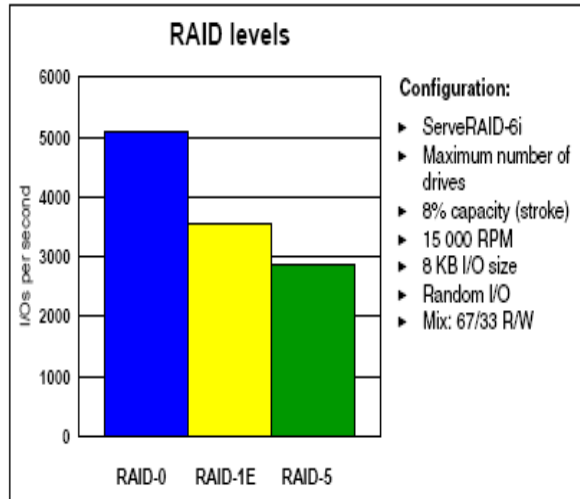
Figure 1-1 Sizing tasks and roles

System Sizing and RAID



System Sizing – Avoid RAID V

- ▶ RAID 5 is typically pushed by hardware vendors as a cost effective option, but it is not really that cost effective when overall performance of the entire server is lower as a result.
- ▶ As can be seen in the graph, Disk I/O per second for RAID 5 is almost half the rate of RAID 0 (striping).
 - Source : IBM X-Series benchmarks from IBM redbooks site



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System Sizing Tips 3



System Sizing

- ▲ Gather as much information as you can
- ▲ Leverage information from existing systems if possible
- ▲ Don't ignore your remote user requirements
- ▲ Scale Up Versus Scale Out
 - Large mololithic server versus separate Application Servers
 - Security, Hosting and Cost implications
- ▲ Dedicate your server to QAD Applications
- ▲ Global QAD Services can assist

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Capacity Requirements Planning



Capacity Requirements – Plan for Growth

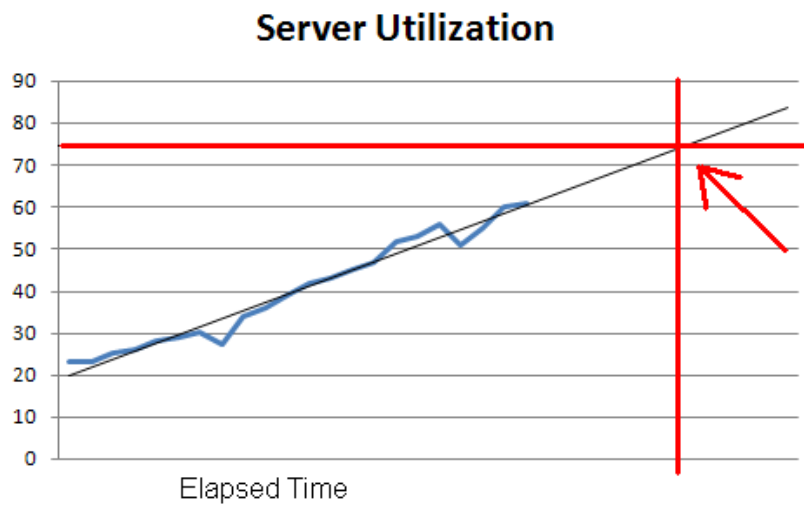
- ▲ Otherwise known as “Re-Sizing”
 - Simpler than initial sizing
 - You can extract precise data from the current system about user numbers, transaction rates, and resource usage
 - Should also be part of your standard planning process
 - Take server measurements on a daily or weekly basis
 - Plot these measurements over time
 - Use Trendlines to predict when a re-sizing process must be undertaken

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Capacity Requirements Planning 2



Capacity Requirements Planning



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Measuring Server Utilization

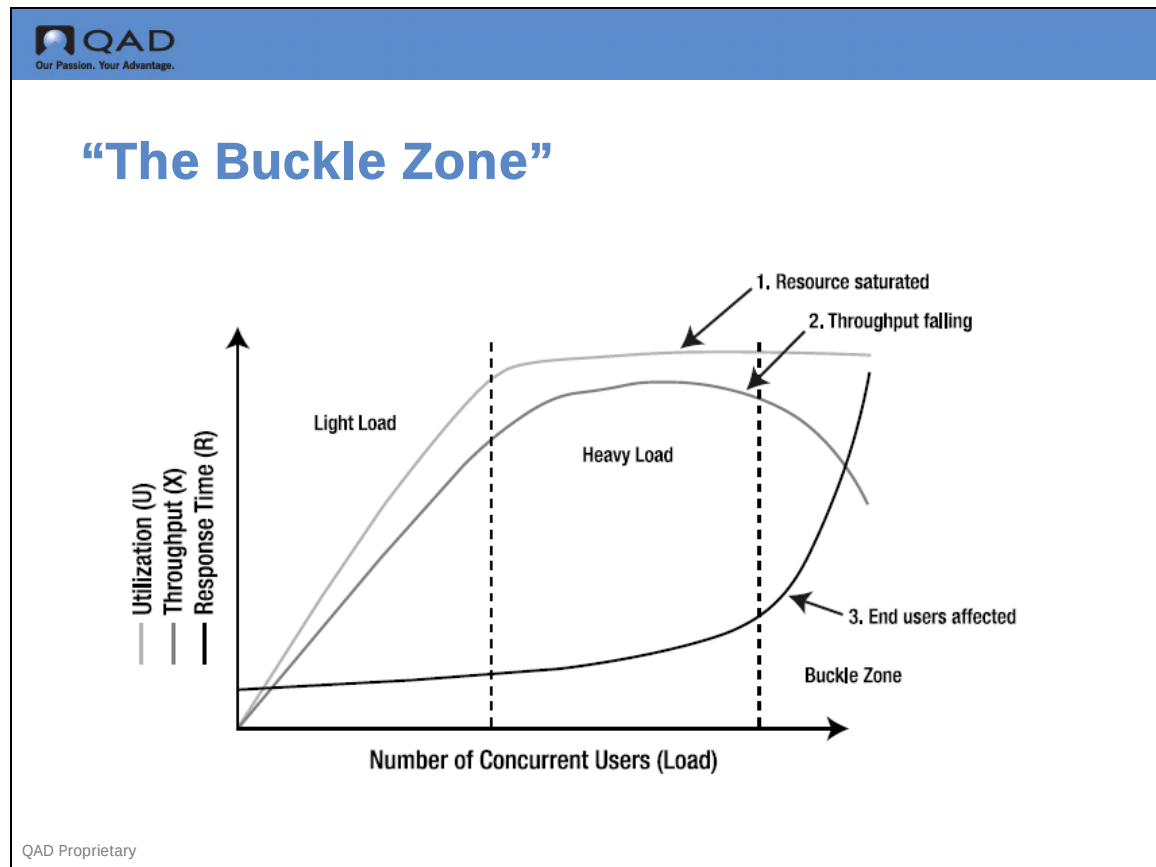


Measuring Server Utilization

- ▲ Identify Bottlenecks
- ▲ Manage by Exception
 - Distinct from Capacity Requirements Planning
- ▲ Understand the Problem
 - Determine the Key Performance Indicators (KPIs)
 - Work out the impact that a bottleneck in a KPI has on application response times

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Buckle Zone



Key Performance Indicators



Key Performance Indicators

- ▲ Availability
- ▲ Processor Utilization
- ▲ Memory and Paging Rates
- ▲ Disk Operations
- ▲ Network Traffic
- ▲ The Database
- ▲ User Interface Response Times

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Availability



Availability

- ▲ If the application is not available when it is supposed to be, the performance is compromised
 - Are overnight batch processes (such as backup or MRP) are taking too long to run?
 - Are there SLAs in place?
 - Are there single points of failure in the infrastructure?

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Tools



Tools

▲ Linux/UNIX

- sar
 - System Activity Reporter
- iostat
- vmstat
- netstat
- Other tools:
 - HP: glance
 - AIX: monitor, topas
 - generic: top

▲ Windows

- Task Manager
- Performance Monitor
- Process Explorer :
<http://www.sysinternals.com/Utilities/ProcessExplorer.html>
- Windows 2003/Vista Server Performance Advisor
 - Download from Microsoft.com

Processor Monitoring



Processor Monitoring

▲ sar, vmstat, top, glance

```
[root@p11i22 ~]# sar -f sadc.21754.sar
Linux 2.6.18-8.el5 (p11i22.qad.com)    04/13/2008
```

		%user	%nice	%system	%iowait	%steal	%idle
10:50:01 AM	CPU						
10:51:01 AM	all	24.53	0.00	0.70	0.12	0.00	74.65
10:52:01 AM	all	51.38	0.00	1.39	0.14	0.00	47.09
10:53:01 AM	all	83.13	0.00	1.86	0.15	0.00	14.85
10:54:01 AM	all	96.49	0.00	2.08	0.07	0.00	1.36
10:55:01 AM	all	97.03	0.00	1.98	0.04	0.00	0.95
10:56:01 AM	all	96.44	0.00	1.95	0.05	0.00	1.56
10:57:01 AM	all	95.28	0.00	2.06	0.10	0.00	2.56
10:58:01 AM	all	93.27	0.00	2.04	0.04	0.00	4.65
10:59:01 AM	all	95.59	0.00	1.99	0.14	0.00	2.28
11:00:01 AM	all	86.55	0.00	1.90	0.26	0.00	11.30
11:01:01 AM	all	50.49	0.00	1.32	0.42	0.00	47.76
11:02:01 AM	all	7.79	0.00	0.59	0.14	0.00	91.47

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Server Load



Server Load

- ▲ sar -q , top, glance
- ▲ A measure of the server utilization
- ▲ A load > number of processing cores indicates the server is over loaded

```
[root@p11i22 ~]# sar -q -f sadc.21754.sar
Linux 2.6.18-8.el5 (p11i22.qad.com)      04.

10:50:01 AM      runq-sz    plist-sz    ldavg-1
10:51:01 AM          4        492        1.77
10:52:01 AM          6        500        3.48
10:53:01 AM          6        506        5.85
10:54:01 AM         10        515        7.85
10:55:01 AM          5        533        8.85
10:56:01 AM         10        513        9.13
```

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Disk Operations



Disk Operations

- ▲ Spread the Load over as many disks as possible
 - RAID 0 or striping is the easiest way
- ▲ Use SAS disk controllers
- ▲ Avoid RAID 5
- ▲ Use Memory to avoid disk access (buffers)
- ▲ Measure using iostat

```
[root@p11i22 ~]# iostat
Linux 2.6.18-8.el5 (p11i22.qad.com)      04/15/2008

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           0.41    0.00   0.08   0.03   0.00   99.48

Device:            tps    Blk_read/s    Blk_wrtn/s    Blk_read    Blk_wrtn
sda                  0.19         4.81         1.04       291359       62840
sdb                  5.30        18.17        107.01     1100224     6478988
```

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Network



Network

- ▲ Keep things local
- ▲ What else is happening on the network?
 - Emails / Browsing / other ERP
 - Can we use Class of Service (WAN), Quality of Service (LAN) or a packet shaper to give QAD applications a higher priority?
- ▲ Poor network design
 - Low speed switches?
- ▲ Different options
 - Single tier
 - Multiple tier
 - Private Networks between server components
- ▲ Response Time is affected by latency
- ▲ Nagle's Algorithm

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Summary



Summary

- ▲ Define your performance requirements
- ▲ Monitor by Exception
- ▲ Sizing is difficult
- ▲ Plan for Growth
- ▲ Change One thing at a time

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OpenEdge Performance



Next : Open Edge Performance

BREAK



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OpenEdge Tuning Techniques



Open Edge Tuning Techniques

- ▲ Use Progress parameters to utilize resources efficiently
 - Examples: -B, -spin
- ▲ Reduce I/O contention
 - Relocate the before-image extents to another I/O channel
 - Supply multiple I/O channels into the physical database
- ▲ Utilize Progress performance aids
 - BIW, APW

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Progress Parameters



Progress Parameters

- ▲ Progress executables have arrays of parameters that can be specified to enhance performance
 - These parameters must be directly passed to the Progress executable
 - Specific parameters are applicable to specific executables
 - Certain parameters must be tuned over time. Check results using the Progress Monitor (promon)
 - QAD is developing an automated toolkit to help monitor Promon information

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Progress Parameters 2



Progress Parameters (cont.)

- ▲ Parameters are classified as one of the following:
 - Client Connection (CC)
 - Database Server (DBS)
 - Data Server (DS)
- ▲ If you would use a –B in a client connection script it would have no effect because –B is a DBS parameter
- ▲ A full listing can be found in the Progress documentation

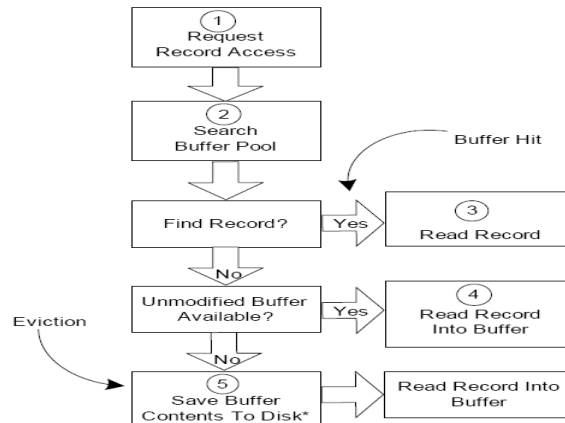
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Database Buffers



Database Buffers

- ▲ Holds copies of database blocks in memory
- ▲ Much faster than accessing from disk
- ▲ If a database access requests a record from a block stored in memory, this is a buffer hit
- ▲ When a new record is read, if there are no empty buffers available, the database engine must replace another buffer to make room for it



* Asynchronous page writers, if they are running, continuously perform this step in the background.

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Buffer Hits



Buffer Hits

Activity - Sampled at 01/10/00 11:25 for 2:46:37.

Event	Total	Per Sec	Event	Total	Per Sec
Commits	3900	0 .3	Undos	1215	0 .1
Record Updates	4717	0 .4	Record Reads	353418	35 .3
Record Creates	12607	1 .2	Record Deletes	10837	1 .0
DB Writes	29778	2 .9	DB Reads	233257	23 .3
BI Writes	27834	2 .7	BI Reads	10592	1 .0
AI Writes	29443	2 .9			
Record Locks	113928	11 .0	Record Waits	0	0 .0
Checkpoints	1591	0 .1	Buffers Flushed	21154	2 .1
Rec Lock Waits	0 %		BI Buf Waits	2 %	AI Buf Waits
Writes by APW	23 %		Writes by BIW	85 %	Writes by AIW
Buffer Hits	87 %				
DB Size	1520 K		BI Size	64 K	AI Size
FR chain	16 blocks		RM Chain	733 blocks	
Shared Memory	184 K		Segments	1	
0 Servers , 1 Users (1 Local , 0 Remote , 0 Batch), 0 Apws					

*Buffer
Hits
Field*

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Memory Tuning



Memory Tuning

- ▲ Ensure Database Buffer hit percentage is as good as it can be
 - 99% +
 - 64 bit operating systems allow for higher -B
 - Don't set -B so high that paging occurs
 - Server Side Parameter
- ▲ Using -Bt for temp-tables (client)
 - Bt 1000 is a good starting value
- ▲ Use -mmax (client)
 - mmax 16384 is a good starting value depending on available memory

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Asynchronous Page Writer



Asynchronous Page Writer (APW)

- ▲ Run one or two per database
- ▲ Writes modified database blocks to disk. This spares the server from having to do it. It also makes it unnecessary to write the modified blocks to the disk at the same time.
- ▲ To start: `DLC/bin/proapw dbname`

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Watchdog



Watchdog

- ▲ The watchdog cleans up after improperly terminated processes
- ▲ If the watchdog finds a process that is no longer active it does the following:
 - Releases record locks
 - Backs out any live transactions
 - Releases shared-memory locks
 - Closes the connection

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OpenEdge Tuning Tips



OpenEdge Tuning – Further Tuning Tips

- Set BI cluster size to 16 or 32 MB
 - System must not checkpoint in less than a minute
- Set BI log block size to 8kB or 16kB
- Set bibufs to 25
- Set –spin to 50000 on faster CPUs
- Set –ttmarshal=3 to all appservers
- Use –T to specify temp file directory
- Use a larger network buffer size (-Mm)
- Limit the maximum clients per database server (-Ma)
- Set the maximum servers (-Mn)
 - Also set the minimum clients per server (-Mi)
- Pin Shared Memory to prevent swapping (-pinshm)

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Checkpoints



Checkpoints

- ▲ Progress must eventually flush updated blocks to disk
 - A checkpoint is a periodic verifications that disk writes are keeping up
 - OpenEdge uses asynchronous checkpoints based on BI clusters
 - APWs will reduce the number of buffers flushed at checkpoint
 - You definitely want them to occur less often than every 60 seconds. 120 seconds is an even better goal

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Monitoring BI Activity



Monitoring BI Activity

01/25/00
11:36:56

Activity : BI Log
04 /12/00 13:56 to 04/13/00 11:23 (21 hrs 27 min)

	Total	Per Min	Per Sec	Per Tx
Total BI writes	131	0	0 .08	0 .10
BIW BI writes	127	0	0 .08	0 .10
Records written	3630	0	2 .31	3 .00
Bytes written	129487	0	82 .42	107 .19
Total BI Reads	13	0	0 .00	0 .01
Records read	0	0	0 .00	0 .00
Bytes read	0	0	0 .00	0 .00
Clusters closed	0	0	0 .00	0 .00
Busy buffer waits	0	0	0 .00	0 .00
Empty buffer waits	0	0	0 .00	0 .00
Log force waits	0	0	0 .00	0 .00
Partial Writes	4	0	0 .00	0 .00

Keep busy buffer waits low; use a BIW.

Eliminate empty buffer waits by providing more BI buffers.

Keep the writes per second low. Reduce this number by increasing the BI buffer size.

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Table Analysis



Table Analysis

▲ proutil db-name -C tabanalysis

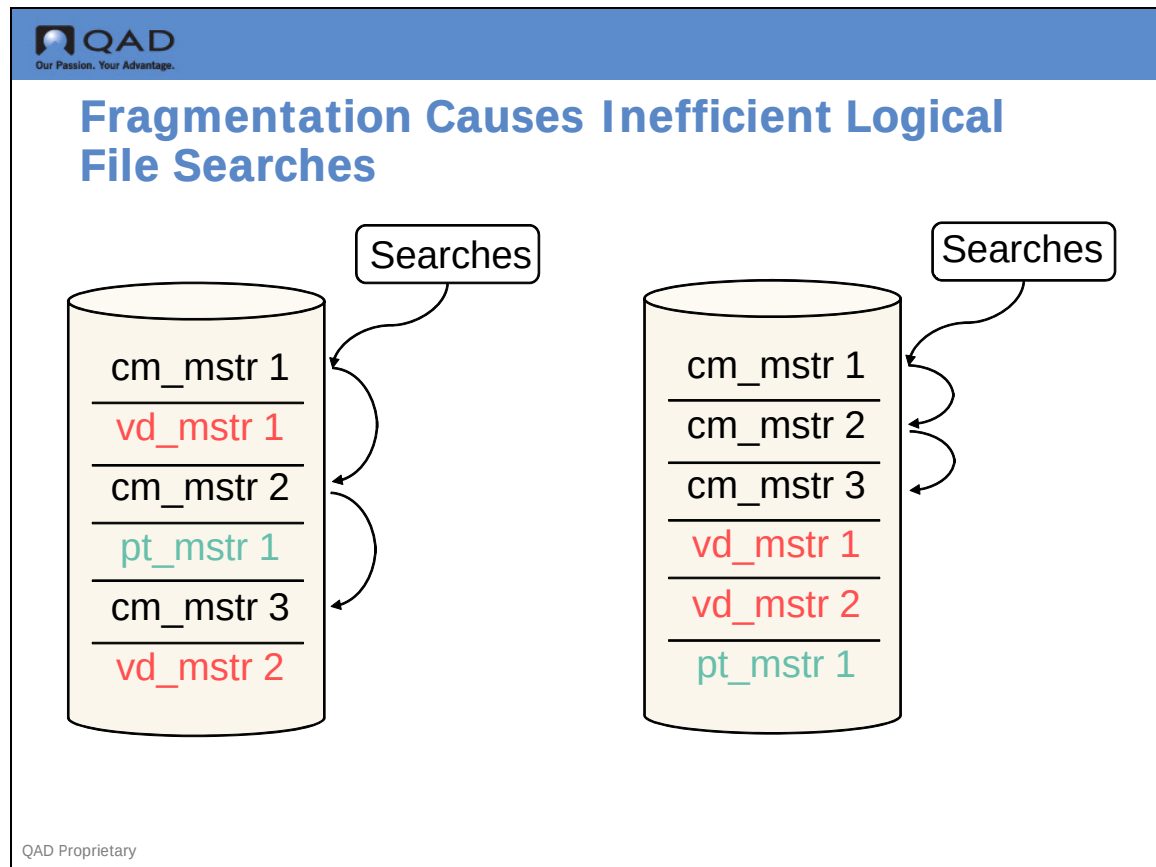
RECORD BLOCK SUMMARY FOR AREA "Info Area" : 7								

Table	Records	Size	-Record Size (B)-			---Fragments---		Scatter
			Min	Max	Mean	Count	Factor	Factor
Customer	83	12.1K	118	222	149	83	1.0	1.5
Invoice	147	5613B	32	45	38	147	1.0	1.2
Item	55	5092B	39	229	92	55	1.0	1.3
Local-Default	10	704B	55	82	70	10	1.0	1.2
Ref-Call	13	2480B	81	328	190	13	1.0	1.4
Salesrep	9	746B	79	87	82	9	1.0	1.2
State	51	1755B	29	40	34	51	1.0	1.0
RECORD BLOCK SUMMARY FOR AREA "Order Area" : 8								

Table	Records	Size	-Record Size (B)-			---Fragments---		Scatter
			Min	Max	Mean	Count	Factor	Factor
Order	207	11.5K	53	61	56	207	1.0	1.3
Order-Line	873	30.3K	33	38	35	873	1.0	1.2
Totals:	4190	431.1K	6	1156	105	4263	1.0	2.5

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Fragmentation



Managing Fragmentation



Managing Fragmentation

- ▲ Dump and reload the database
 - This removes the gaps between records
 - This becomes more efficient
 - Must be done offline
- ▲ Move tables and indexes
 - Use proutil with tablemove and idxmove
 - This can be done online

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Index Analysis



Index Analysis

▲ proutil db-name -C idxanalys

INDEX BLOCK SUMMARY FOR AREA "STATIC_IDX" : 10

Table	Index	Fields	Levels	Blocks	Size	% Util	Factor
PUB.acdf_mstr							
acdf_index1	41	9	2	3	14.0K	58.5	1.8
PUB.acm_mstr							
acm_index	45	4	1	1	3.0B	0.0	1.0
acm_unique	46	5	1	1	3.0B	0.0	1.0
PUB.acod_mstr							
SourceValue	47	8	1	1	3.0B	0.0	1.0
PUB.act_mstr							
act_order	48	4	1	1	3.0B	0.0	1.0
PUB.acx_mstr							
acx_index	49	6	1	1	3.0B	0.0	1.0
acx_to_index	50	6	1	1	3.0B	0.0	1.0
PUB.ac_mstr							
ac_active	52	3	2	3	8.9K	37.2	2.3
ac_code	51	2	2	3	8.9K	37.1	2.3
ac_curr	53	2	1	1	704.0B	8.6	1.0
ac_desc	54	3	2	6	21.6K	45.2	2.1
ac_fpos	55	3	2	4	9.6K	30.0	2.4
ac_type	56	3	2	4	9.0K	28.2	2.4

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Index Utilization - Key Indicators



Index Utilization – Key Indicators

- ▲ % Util: If your index is several hundred blocks and you retrieve records by that index, an index utilization of 85% or higher is optimal
- ▲ Factor Value: Used to determine if the index should be rebuilt

Factor range	Description
1 to 2	The index is well-utilized and balanced. You do not have to rebuild it.
2 to 2.5	The index is less than 50 percent utilized and/or the index is unbalanced. You should consider a rebuild.
2.5 to 3	The index is less than 25 percent utilized and/or the index is very unbalanced. You should rebuild this index.

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Monitoring User I/O



Monitoring User I/O

- ▲ Locking, Transaction, Table and Index activity can be monitored on a per user basis
 - Unfortunately, using an Appserver can obfuscate this
 - PROMON->R&D->Other Displays
 - Small overhead in memory consumption (< 5 MB)
- ▲ Also held in the _UserTableStat and _UserIndexStat virtual system tables

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Virtual System Tables



Virtual System Tables

- ▲ Allow you to query the database using ABL or SQL code to obtain the same information as presented by PROMON
- ▲ Some VSTs enabled by default. To enable the rest :
 - #proutil *dbname* –C updatevst

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Application Tuning Tools



Application Tuning Tools

- ▲ Beyond the scope of this course
- ▲ But, investigate the following
 - Compiling with XREF
 - Code execution cost using the Profiler
 - Runtime index use and bracket depth using `-zqil`
 - Procedure call statistics with cross reference `-yx`

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Troubleshooting



Fixing things

TROUBLE SHOOTING



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Database Preventative Maintenance



Database Preventative Maintenance

- Backups. Your last line of defence.
 - Test them!!!
- UNIX/Linux : try to avoid logging on as root unless you need to
- UNIX/Linux : don't use *kill -9* on a self service client. You *can* crash the database
- Always have an up to date structure file. Keep it on a different machine (your desktop, perhaps)
- Set up operating system security to protect your database
- EnableLargeFiles on the database to overcome the 2GB limit

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Database Preventative Maintenance 2



Database Preventative Maintenance

- Use Promon or a custom program to monitor the database
 - Transactions that stay open a long time
 - Lock table
 - Database high water mark to prevent variable extent growth
 - I/O is unbuffered in the variable extent
 - New chunks are requested in 512 block sizes
 - » Performance hit
 - You could run out of disk space
- Use After Imaging
 - Disk mirroring doesn't guard against sysadmin/DBA/user error
- Use the Progress watchdog
 - \$DLC/bin/prowdog *dbname*
 - Detects improperly terminated processes and cleans up after them
 - Backs out transactions and releases shared memory

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Database Preventative Maintenance 3



Database Preventative Maintenance

▲ Corruption Checks

- proutil dbanalys
- probkup / procopy
- proutil dbrpr
- proutil dbscan
- proutil idxfix
- Check the database log files
 - Search/grep for *kill drastic warn error system fatal exceed abnormal wrong unexpected invalid damage overflow violation insufficient missing disappear corrupt attempt cannot illegal impossible beyond unknown available stop increase*

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Database Preventative Maintenance 4



Database Preventative Maintenance

▲ proutil dbrpr

- Not widely documented
- Truncate the BI file before use
 - You may need to force (-F) the operation

DATABASE REPAIR MENU

```

-----
1. Database Scan Menu
2. Test One or More Indexes
3. Remove Bad Record Fragment
4. Dump Block
5. Load Block
6. Copy Bytes Between Files
7. Load RM Dump File
8. Reformat Block to a Free Block
9. Change Current Working Area
10. Display the Free Chain
11. Display the RM Chain
12. Display the Index Delete Chain
13. Display Block Contents
14. Display Record Contents
15. Display Cluster Chain (Type II Area)
16. Scan/Fix block checksum (Type II Area)
    A. Try to read additional Index/Table info
    P. Print Info Menu

Q. Quit

(Current Working Area: Schema Area)
.....
  
```

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Database Preventative Maintenance 5



Database Preventative Maintenance

▲ proutil dbscan

```

Scanning /dr01/eb3/build29/dbs/instance.db
From dbkey 64 to dbkey 320

Scan of Control Area extent 1 25% complete
Scan of Control Area extent 1 50% complete
Scan of Control Area extent 1 75% complete
Scan of Control Area extent 1 100% complete

Scanning /dr01/eb3/build29/dbs/instance.d1
From dbkey 64 to dbkey 19008

Scan of Schema Area extent 1 10% complete
Scan of Schema Area extent 1 20% complete
Scan of Schema Area extent 1 30% complete
Scan of Schema Area extent 1 40% complete
Scan of Schema Area extent 1 50% complete
Scan of Schema Area extent 1 60% complete
Scan of Schema Area extent 1 70% complete
Scan of Schema Area extent 1 80% complete
Scan of Schema Area extent 1 90% complete
Scan of Schema Area extent 1 100% complete
Extent /dr01/eb3/build29/dbs/instance_8.d6 is above high water mark, skipping...
Extent /dr01/eb3/build29/dbs/instance_8.d5 is above high water mark, skipping...
Extent /dr01/eb3/build29/dbs/instance_8.d4 is above high water mark, skipping...

Scanning /dr01/eb3/build29/dbs/instance_9.d1
From dbkey 32 to dbkey 704

Scan of Index Area extent 1 14% complete
Scan of Index Area extent 1 23% complete
Scan of Index Area extent 1 33% complete
Scan of Index Area extent 1 42% complete
Scan of Index Area extent 1 52% complete
Scan of Index Area extent 1 61% complete
Scan of Index Area extent 1 71% complete
Scan of Index Area extent 1 80% complete
Scan of Index Area extent 1 90% complete
Scan of Index Area extent 1 100% complete

```

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Database Errors



Database Errors

- ▲ 1124 errors
 - SYSTEM ERROR : wrong dbkey in block
 - Usually a hardware problem
 - Disk Controller , Disk
 - RAM parity error
 - Firmware
 - If a hardware technician examines the system and can't find anything wrong, ask for another opinion

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Database Disk Full



Database Disk Full

- ▲ Manually move some extents to a place with more space
 - Update the structure file
 - prostrct repair
- ▲ Use prostrct add to add new extents

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Before Image (BI) Disk Full



Before Image (BI) Disk Full

- ▲ Try to avoid running out of BI disk space
 - Usually nasty to recover from
- ▲ The BI file can grow quite large, quite quickly
 - If there is no space to grow, there is no crash recovery
- ▲ If the database fails due to the inability to extent the BI file, you must truncate the BI file
 - Use this method if you accidentally delete the BI file as well ...
 - Use the force (-F) option
 - The database will be marked as (potentially) damaged
 - Schedule a dump and reload / restore from backup

```
The -F option has been specified to proutil. (6260)
Forcing into the database skips database recovery. (6261)
This leaves the database in an unknown state, considered damaged. (6262)
Are you sure you want to skip crash recovery? (Y/N) (6263)
```

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Corrupt Blocks



Corrupt Blocks

- ▲ Index Block
 - Index Rebuild
- ▲ RM block
 - Backup database
 - Use proutil dbrpr to reformat as a free block
 - Replace the block from another DB (recent backup)
 - Proutil dbrpr
 - 4. Dump Block
 - 5. Load Block
 - Is it the right block?
 - Look at the update counter stored in the block header
 - 13. “Display block contents”

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Emergency Dump/Damaged Extents



Emergency Dump / Damaged Extents

- ▲ Front and Back 4GL dump
 - For each pt_mstr by pt_part
 - Until you hit the corruption
 - For each pt_mstr by pt_part descending
- ▲ Use an alternative index, if the primary index is damaged
 - Or try fixing the index (proutil idxfix)
- ▲ RECID dump
 - No indexes
 - Extremely slow
 - Last resort

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Deleted AI Extents



Deleted AI extents

- ▲ Disable AI (rfutil aimage end)
- ▲ Recreate the extent (prostrct add)
- ▲ Restart AI (rfutil aimage begin)
- ▲ If that doesn't work
 - Disable AI
 - Truncate the BI file (-F)
 - Use prostrct remove to remove ALL AI extents
 - Recreate the original AI extents
 - Restart After Imaging

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Deleted DB Extents



Deleted DB extents?

- ▲ Restore DB from backup
- ▲ Reapply AI files
- ▲ Done
- ▲ If not using AI :
 - Restore a copy of the deleted extent from backup
 - Copy the extent to the correct place
 - prostrct unlock (syncs the time stamps)
 - You could be lucky ...
 - Most likely you will have lost some data

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Deleted DB Master Block



Deleted DB master block (.db)

- ▲ prostrct bulddb
- ▲ Needs an up to date structure file
- ▲ Progress v9/OpenEdge 10+ only

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Releasing Shared Memory



Releasing shared memory

▲ Windows

- There are 3rd party tools which can release shared memory
- But it is safest to reboot
- If the reboot doesn't fix the problem, run prostrct repair

▲ UNIX/Linux

- PROUTIL –C DBIPCS
 - Shows shared memory
- ipcrm –m
 - UNIX command to release

OpenEdge ID	SHARED ShMemVer	MEMORY Seg#	STATUS InUse	Database
68	-	-	-	(not OpenEdge)
100	3	0	Yes	/db/work5/sports
101	3	1	-	/db/work5/sports
120	3	0	No	/db/work5/test
150	2	-	-	(unsupported shared memory version)

