

IBM Software



Business Analytics **Forum** 2012

March 13 - 15, 2012

Melbourne – VIC – Australia

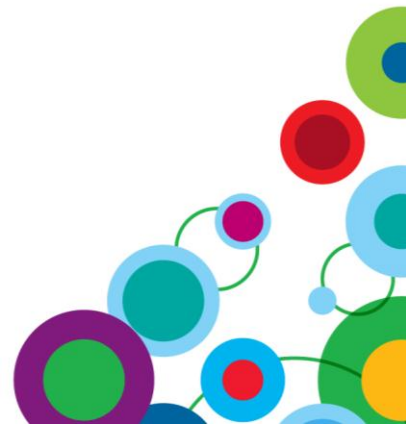
IBM Cognos 10.1.1 Technical Architecture Super Session

Barnaby Cole
IBM Cognos Technical Architect



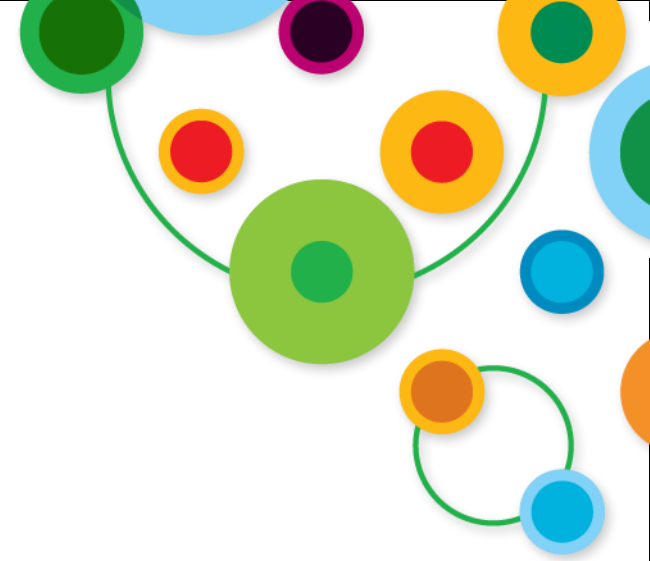
Overview

- IBM Cognos 10.1.1
 - IBM Cognos 10.1.1 Infrastructure
 - IBM Cognos 10.1.1 Technical New Features
 - IBM Cognos 10.1.1 Dynamic Query Mode
 - IBM Cognos 10.1.1 Upgrade and Migration



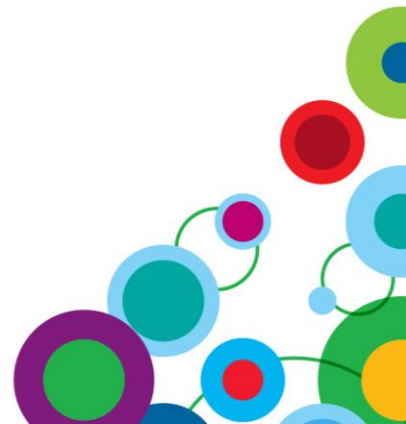
IBM Cognos 10.1.1 Infrastructure

IBM Cognos Infrastructure 10.1(.1) Infrastructure

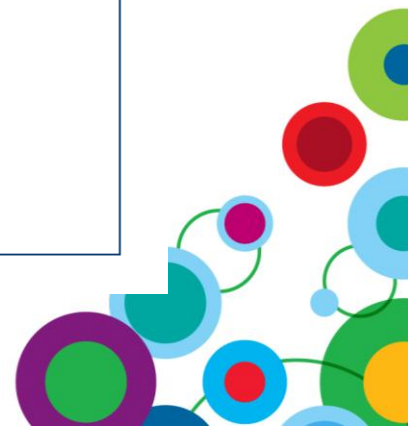
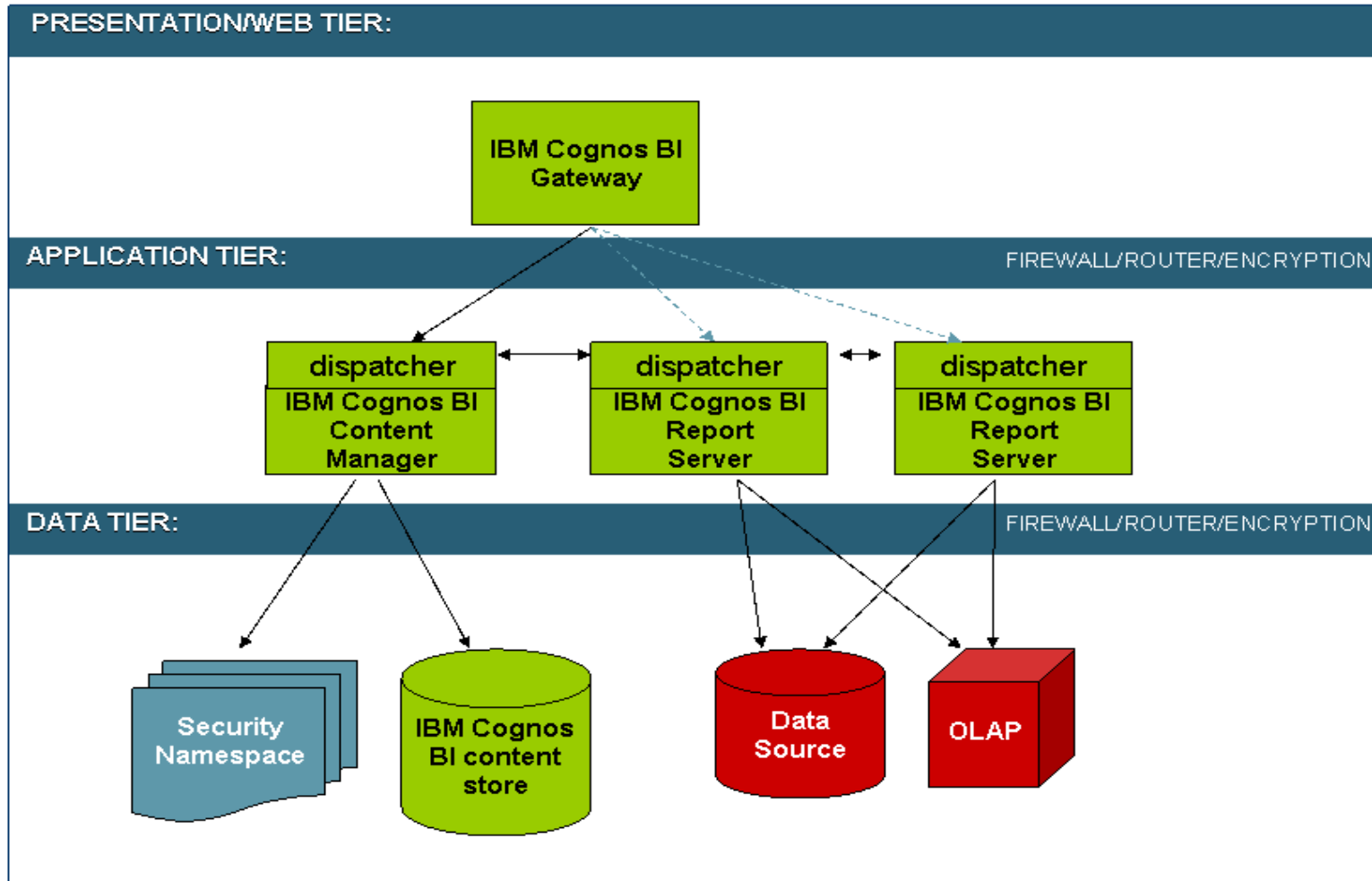


Cognos 10.1.1 Overview

- We still have **Broad Proven Analytics** in a **Unified Workplace** on a **Proven Platform**.
- The Architecture has not changed dramatically, only the ways we model and access data.
 - We are still SOA, Peer to Peer and OPEN
 - DQM
 - 64-bit Report Server
 - New Modeling Techniques
 - Content Archival
 - Mobility Story changing with the times

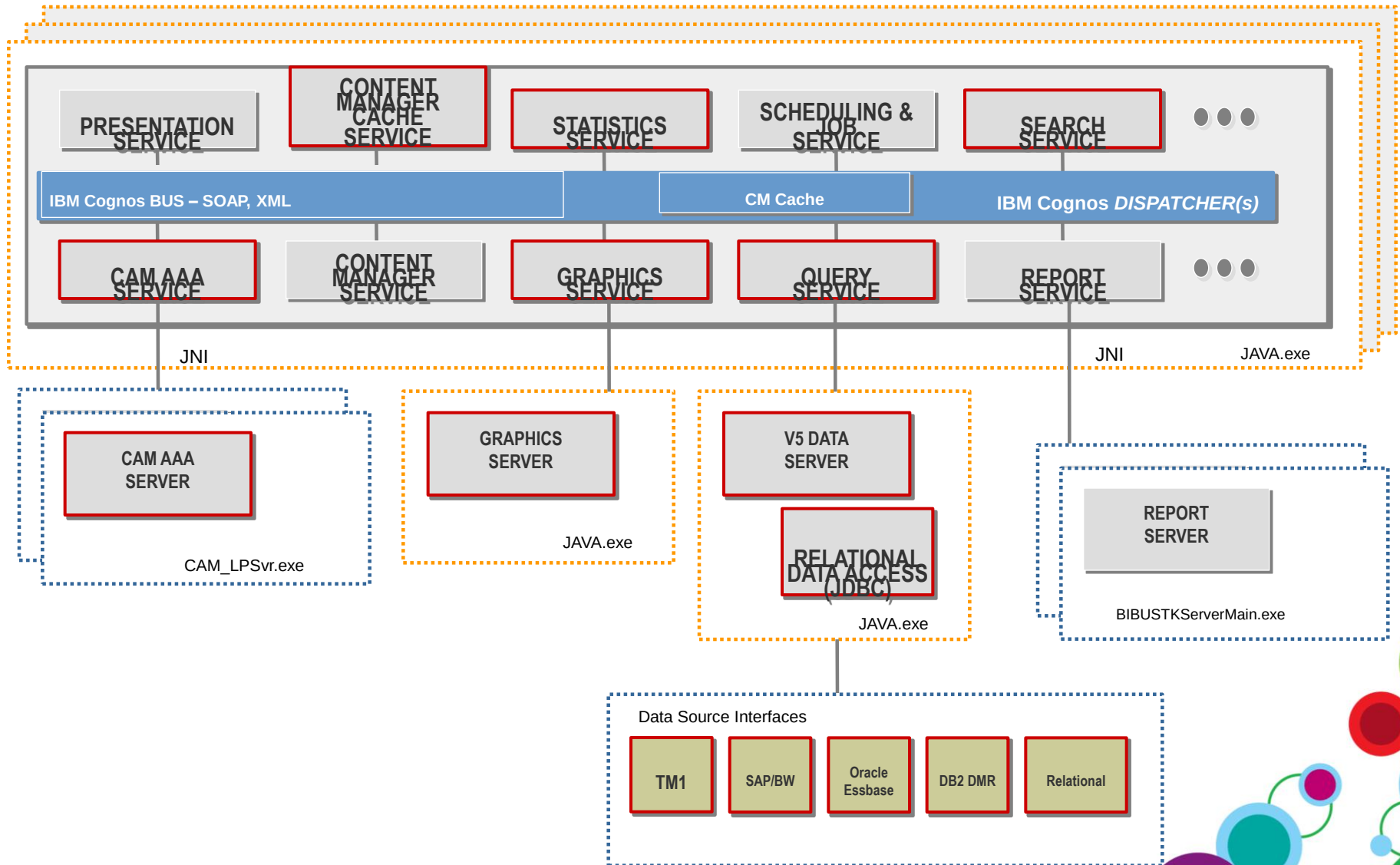


IBM Cognos BI Architecture



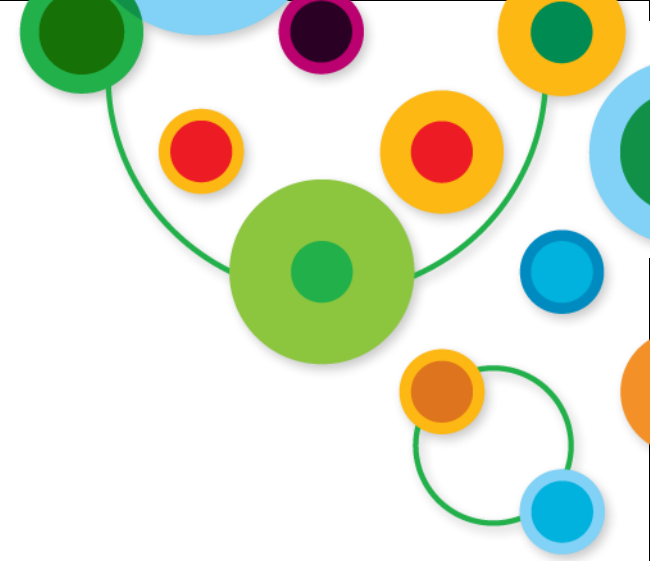


SOA – IBM Cognos 10.x New Services

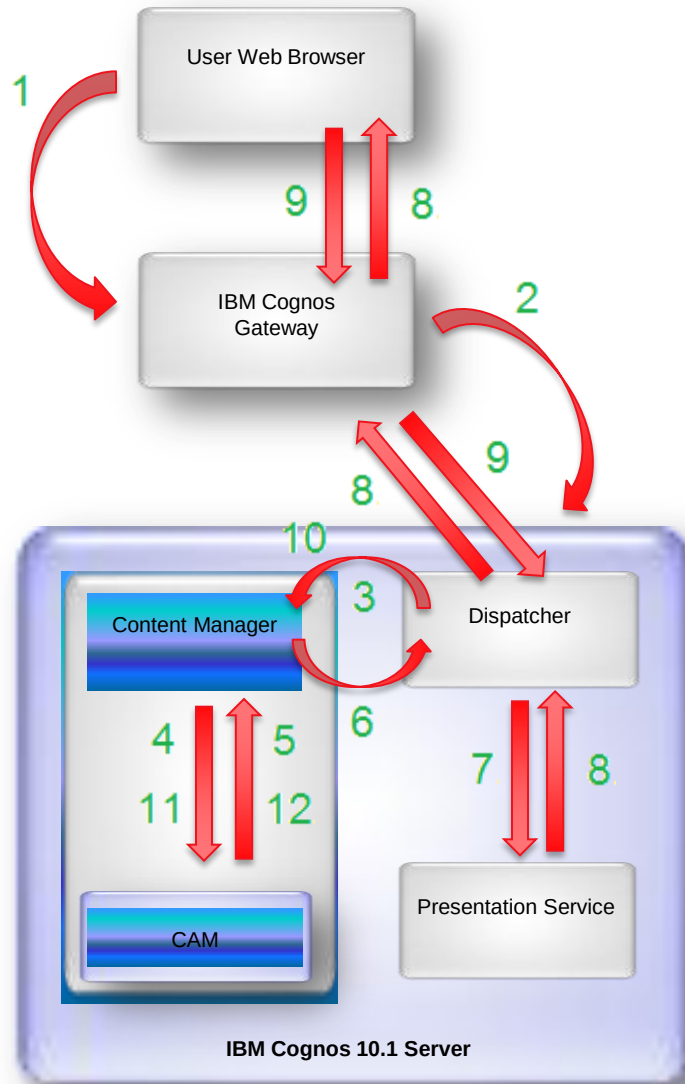


IBM Cognos 10.1.1 Infrastructure

Content Manager – New Features



Request Flow - Authentication



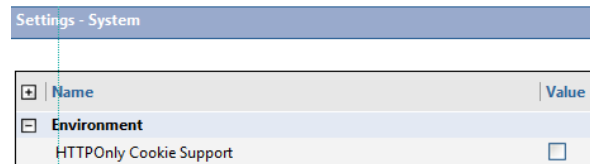
1. User makes request to access **IBM Cognos Connection**
2. Gateway accepts request and sends it to the **Dispatcher**
3. Dispatcher detects no Passport and sends request to **Content Manager**
4. **Content Manager** sends request to **Cognos Access Manager**
5. **CAM** returns fault with required information
 1. System recoverable – Single Sign On (step 9)
 2. User recoverable – Basic authentication
6. **Content Manager** returns request and fault to **Dispatcher**
7. The **Dispatcher** sends the request to the **Presentation Service**
8. The **Presentation Service** generates the login page and returns the page through the **Dispatcher** and **Gateway** to the user
9. The User enters their credentials, or it is pulled from the environment for Single Sign On
10. The **Dispatcher** sends the request to **Content Manager**
11. **Content Manager** sends the request to **CAM**
12. If the details are valid, **CAM** issues a **passport** and sends request to **Content Manager**.
If invalid, return to Step 6



What's new with Content Manager 10.1.1

- Secure the CAM passport cookie

Administrators can secure the CAM passport cookie by enabling the HTTPOnly attribute. This blocks scripts from reading or manipulating the CAM passport cookie during a user's session with their web browser.



- Maintain Content Manager Section Content IDs during deployment

Content ids are deleted by default during deployment, however, now when you run a deployment import, you can choose to retain content ids. Retaining content ids is important for certain functionality. for example. when archiving content to

Store IDs:

Selecting 'Do not assign new IDs during import' could result in content being overwritten and lost.

- ☒ Assign new IDs during import
- ☐ Do not assign new IDs during import

- 64-bit Series 7 Namespace

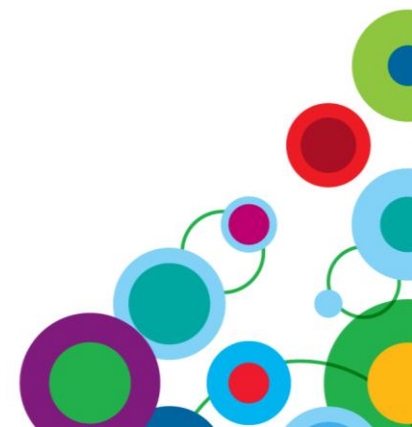
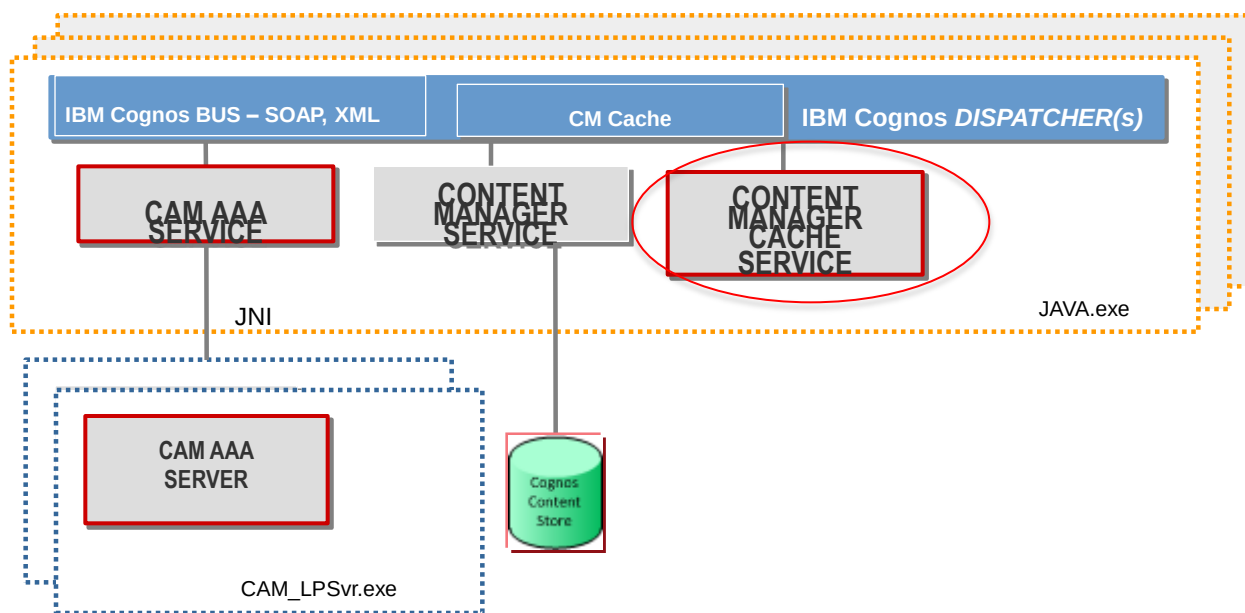
Content Manager now supports a 64-bit Series 7 namespace.



Content Manager Cache Service



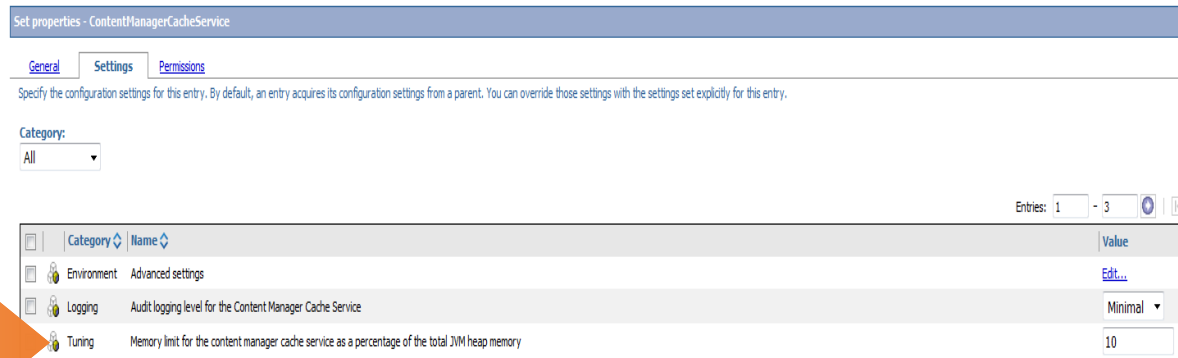
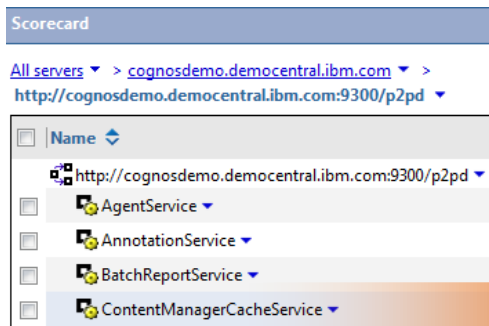
- Each Dispatcher maintains a local cache for objects retrieved from Content Manager Service
 - Used to decrease load on the active Content Manager and improve speed
 - Objects subject to caching:
 - Report, ReportCache, Package, PackageConfiguration, model, modelViews, DatasourceSignon, account, session
- After having verified CMCS is available on the local Dispatcher
 - IBM Cognos Services will query the **local** CMCS instead of CM Service. Supported by CC, QS, RV, ..and others





Set the Cache Size Limit for the Content Manager Cache

- Specify the upper limit of the cache size, as a percentage of the JVM heap
- Increasing the cache size can reduce the load on the Content Manager, allowing it to serve more distributed nodes.
- Setting the value to 0 (zero) disables the cache system-wide, sending all query requests directly to the Content Manager, which may degrade system performance. This is useful for comparing performance with and without the cache.



Linger Timer - Determines the linger time before data is validated

`DISP.contentManagerCacheService.cacheValidatorTimeToLinger` (value is in ms, default 30000)

Validation Timer - Determines how long data objects remain in the cache. After the Validator timer expires objects are considered invalid and have to be fetched from CM again.

`DISP.contentManagerCacheService.cacheValidatorTimeToLive` (value is in ms, default is 900000)

Account inactivity Timer - Determines how long data for this session is cached. If the session is idle for longer than the inactivity timer, all data cached for that account is purged from cache. This is a security and resource saving feature.

`DISP.contentManagerCacheService.accountInactivityTimer` (value is in ms, default is 900000)





Reduce Content Manager Load

- Store user session files on the report server local file system
- Change the location where user session files are stored
- Set the lifetime that temporary user-session cache files are kept

IBM Cognos Administration

Administrator Log On Launch ?

Set properties - Configuration

General Settings Permissions

Specify the configuration settings for this entry. By default, an entry acquires its configuration settings from a parent. You can override those settings with the settings set explicitly for this entry.

Category: Tuning

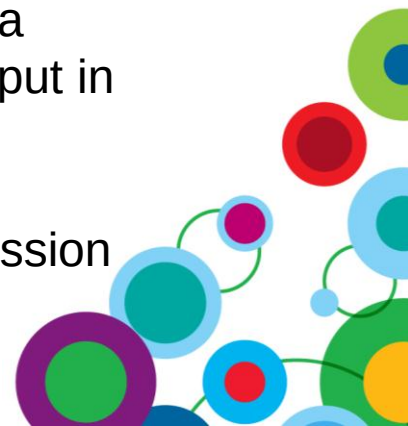
Reset to default value

Entries: 1 - 98

Category	Name	Value	Default
Tuning	Processing capacity	1.0	Yes
Tuning	Load balancing mode	Weighted Round Robin	Yes
Tuning	Temporary objects location	Server File System	Yes
Tuning	Temporary objects lifetime	Content Store	Yes

Reduce the Content Manager Load by Storing User Session Files Locally

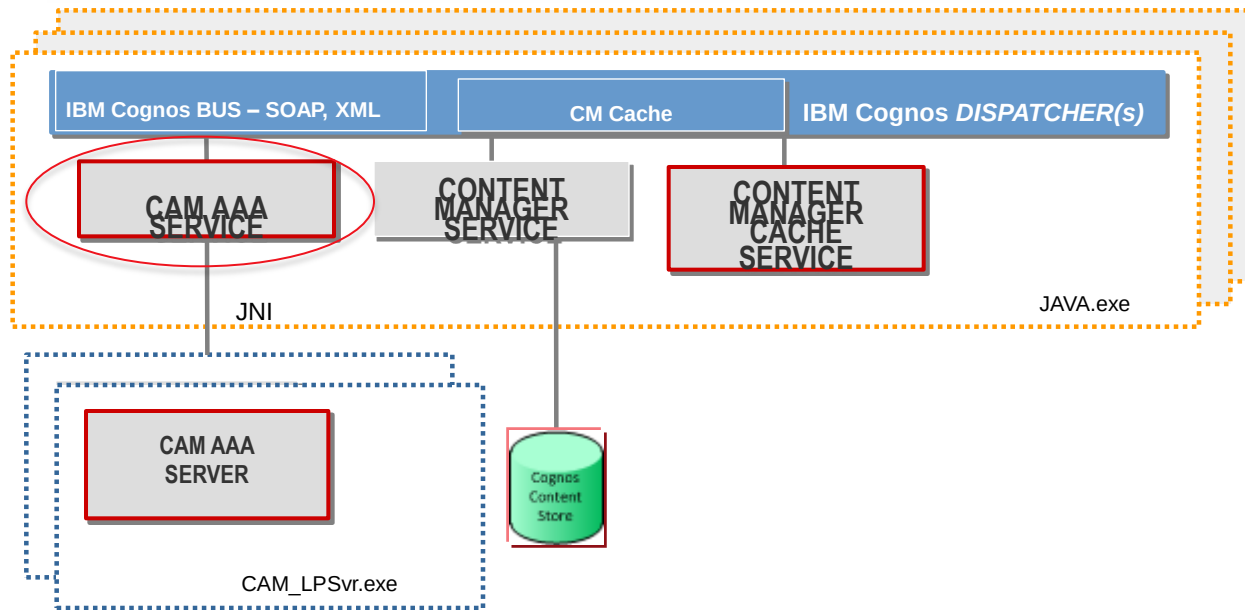
- When a user runs an interactive report, the report server sends a request to the Content Manager, asking it to store the report output in the session cache for the user.
- To reduce the processing load on the Content Manager, user session files are stored on the report server local file system.



Cognos Access Manager (CAM)

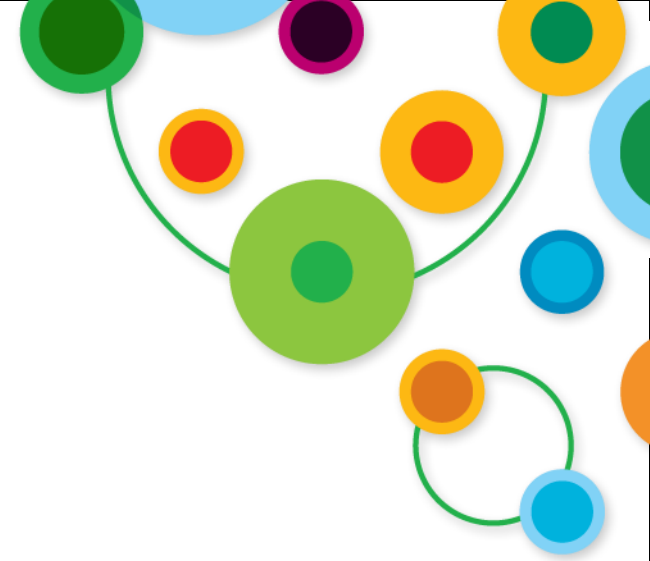
- Cognos 8.x Content Manager shared memory with CAM
 - More users meant more memory was required
 - Cognos 10 creates a new process for each configured authentication provider (CAM_LPSvr)

Image Name	PID	User Name	CPU	Working Set ...	Description
CAM_LPSvr.exe	11260	SYSTEM	00	23,356 K	CAM_LPSvr.exe
CAM_LPSvr.exe	10656	SYSTEM	00	18,732 K	CAM_LPSvr.exe



IBM Cognos 10.1.1 Infrastructure

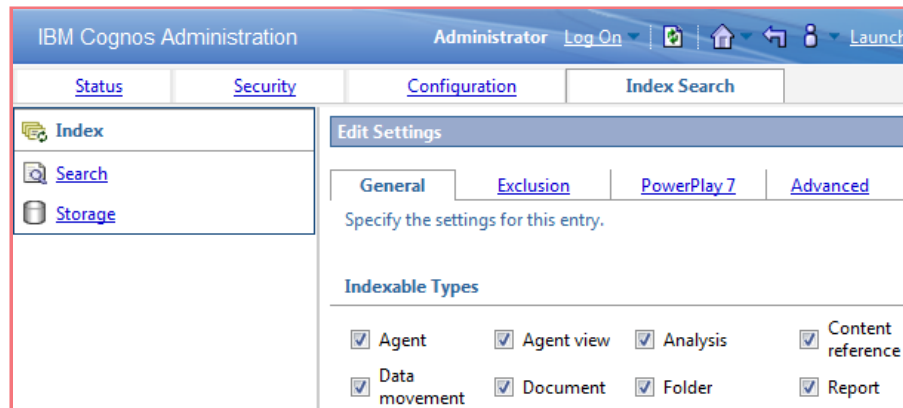
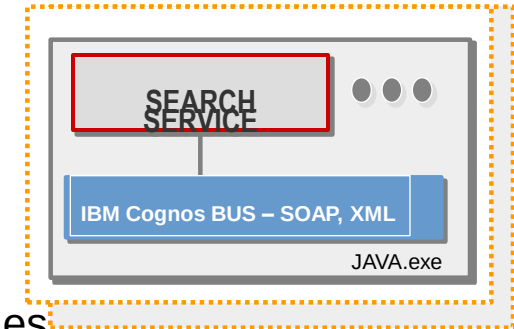
Infrastructure and Administration – New Features





Restricting searches of IBM Cognos content

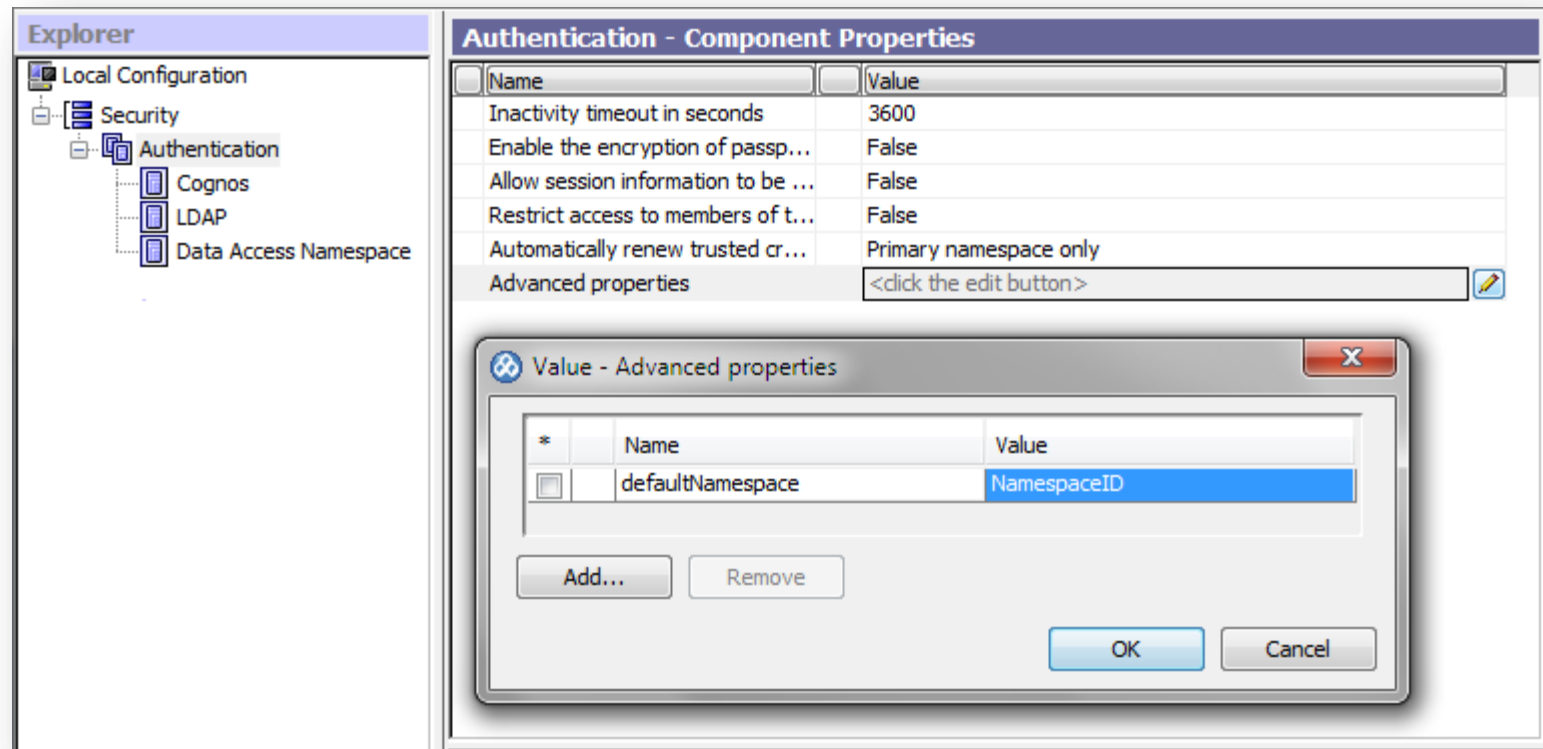
- To avoid system degradation caused by unrestricted searches of large Content Manager data stores, administrators can restrict search activity so that only index search is available to users
 - To restrict searches to indexes only, on the advanced properties for the Presentation Service set `portal.disablecmsearch = True`
- IBM Cognos Business Intelligence version 10.1.1 now supports active reports with indexed search
 - To include active reports in an index, in IBM Cognos Administration, go to the **Index Search** tab, **Index**, **General** tab. Under **Indexable Types**, select **Report**





Security - Primary Namespace ID

- New feature added in Cognos 10.1.1 RP1
- Forces authentication to the configured namespaceID
- Allows for subsequent logins to additional namespace(s)





Strong Encryption

Corporate standards require that all applications support at least 128 bit encryption algorithms.

- Cognos 8.x provided 40 or 56 bit encryption algorithms
- An additional package could be obtained to provide 168 bit algorithms
 - Restricted due to Canadian export control laws
 - Additional cost for package

Name	Value
Type	Cognos
* Certificate location	../configuration/certs
* Confidentiality algorithm	Advanced Encryption Standard with Cipher Block Chaining (CBC) Mode (128-bit key)
* PDF Confidentiality algorithm	Data Encryption Standard with Cipher Block Chaining (CBC) Mode (56-bit key)
* Supported ciphersuites	RSA security RC2 (40-bit key) RSA security RC2 with Cipher Block Chaining (CBC) Mode (128-bit key) RSA security RC4 (128-bit key) RSA security RC4 (40-bit key)
* Identity name	
* Server common name	
* Organization name	
* Country or region code	Triple DES/DES EDE (Encrypt-Decrypt-Encrypt) with Cipher Block Chaining (CBC) Mode (168-bit key)
Signing key settings	
* Signing key store location	../configuration/signkeypair
Signing key store password	*****
Encryption key settings	

Cognos 10.1 provides 168 bit encryption out of the box!



Logon Page Customization

- The IBM Cognos 10 logon page can be fully customized.

Log on [Help](#)

Please type your credentials for authentication.

Namespace:
Sample LDAP namespace

User **User Name / Code d'utilisateur:**

Password:

OK **Cancel**

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Header section
(CL_HEADER)

Prompt section
(CL_PROMPT)

Footer section
(CL_FOOTER)

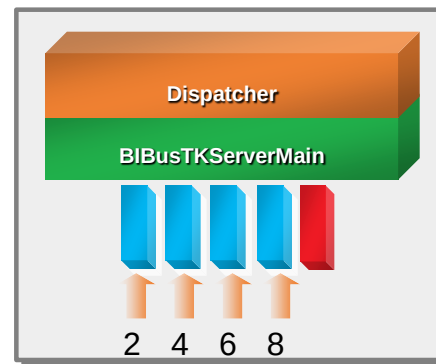
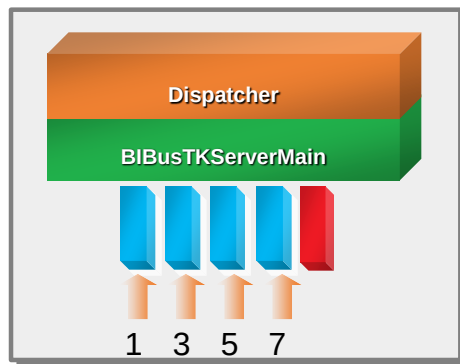
- Create file called sampleIOD.xhtml
 - `<installation_location>/webcontent/ps/login`
- Enter necessary line modifications
 - `<div id="%CL_PROMPT_username_label%">User Name / Code d'utilisateur:</div>`
- Enable custom login
 - Edit system.xml file
 - `<installation_location>/templates/ps directory`

```
<!-- Custom login/logoff configurations -->
<param name="custom-auth">
  <logoff enabled="false">
    <!-- URL to direct to upon logoff. Note: the 'redirect-url' url specified is subject to validation at runtime -->
    <redirect-url></redirect-url>
  </logoff>
  <logon enabled="true">
    <!--
      At runtime, template name is constructed as base-template-name_<productLocale>.
      If base-template-name_<productLocale> does not exist, base-template-name is used.
      Note 1: Template filename extension is expected to be .xhtml
      Note 2: Template is relative to ../webcontent/ps/login
    -->
    <base-template-name>sampleIOD</base-template-name> <!-- e.g.: my_customtemplate_1 -->
  </logon>
</param>
</system>
```

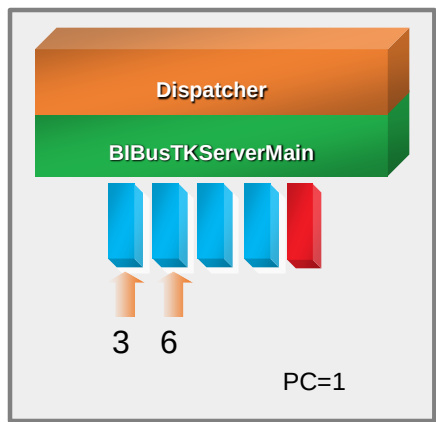
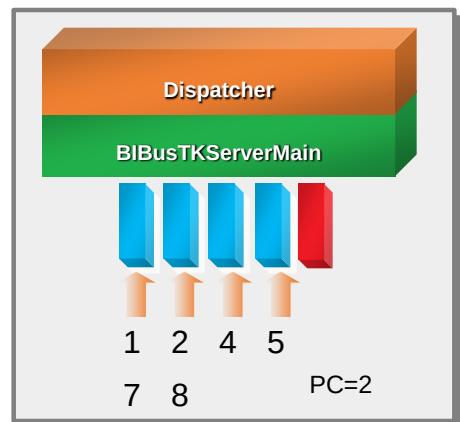
Tuning Cognos Load Balancing



Default round-robin load balancing

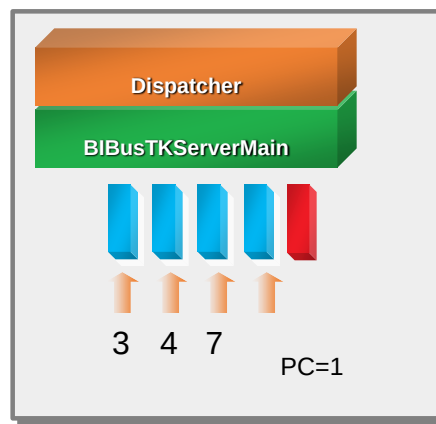
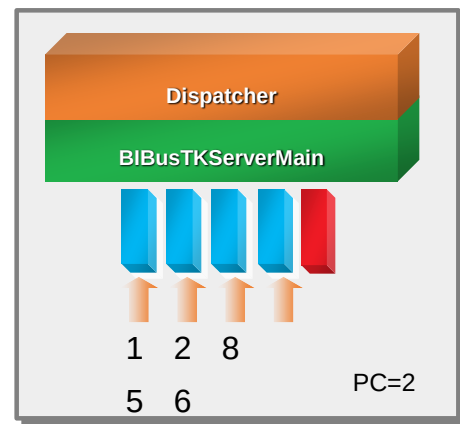


Weighted round-robin load balancing
(Processing Capacity only)



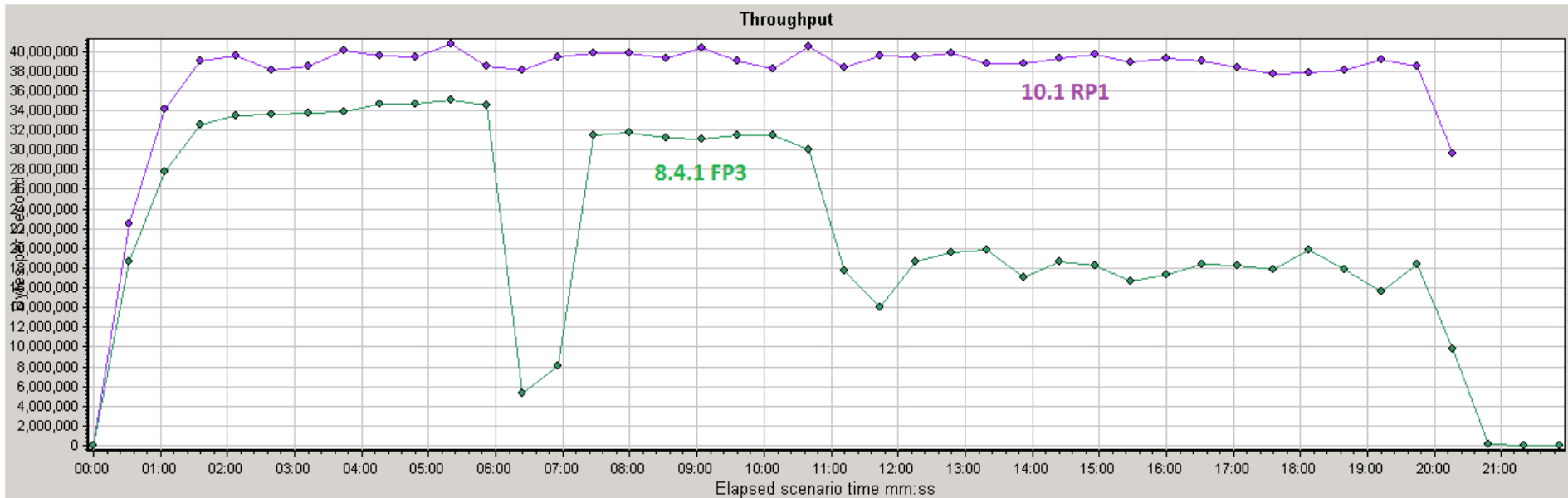
Round-robin load balancing with
Processing Capacity weighting &
inProgressRequestFactor=2.0

Requests 1 and 2 are long running reports.
While 1 & 2 are running
inProgressRequestFactor=2 forces dispatcher to
route requests 3 and 4 to Server_2
Requests 1 and 2 complete; requests 5 and 6 are
short running and so normal processing capacity
weights are applied and request 7 is routed to
Server_2 and request 8 to Server_1



Impact of inProgressRequestFactor

More consistent and stable distribution of load and improved throughput

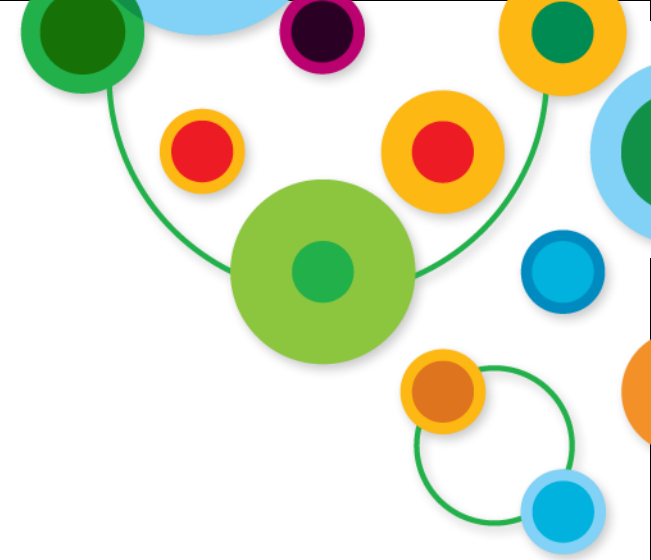


Set `DISP.default.inProgressRequestFactor = 2` at the System Level



IBM Cognos 10.1.1 Infrastructure

- **64-bit vs. 32-bit Installation Packages**
- **64-Bit Report Server**





Cognos BI v10.1.1 64-bit Components

PRESENTATION TIER

CAPABILITIES

- Query
- Reporting
- Analysis
- Scorecarding
- Dashboarding
- Financial Performance Management
- Statistical Analysis
- Event Management
- Centralized Administration

CONSUMER MODES

- Web
- Search
- Mobile
- MS Office
- Lotus Connections

INTEROPERABLE

- Enterprise Search Integration
- Application Embeddable
- BPM Integration
- Enterprise Collaboration

Web Gateways, Web Services API
Industry Standard Portals (IBM, SAP, Plumtree, SharePoint, WRSP)
Cognos Application Firewall

APPLICATION TIER

PURPOSE-BUILT SERVICES

PRESENTATION SERVICE

EVENT SERVICE

STATISTICS SERVICE

SCHEDULING & JOB SERVICE

SEARCH SERVICE

LOGGING/AUDIT SERVICE

CONTENT MANAGER SERVICE

METADATA SERVICE

QUERY SERVICE

REPORT SERVICE

IBM Cognos BUS – SOAP, XML

IBM Cognos DISPATCHER(s)

SINGLE OPEN API

DATA SOURCES

PROVIDERS

LDAP, Active Directory, NTLM, Tivoli, Netegrity, SAP BW, Cognos Namespace, Custom Providers

CONTENT STORE

Storage: DB2, Oracle, SQL Server, Sybase, Derby

COMMON METADATA MODEL

Message Sources

Relational Sources

Application Sources

OLAP Sources

Modem and Legacy Sources

Enhanced Content Manager Support S7 Namespace with 64-bit

New 64-bit Report Service

Enhanced DQM Supported DQM Data sources

IBM DB2, Oracle, SAP, PeopleSoft, Microsoft SQL Server, Teradata, Informatica, SAP, PeopleSoft, IBM Cognos TM1, PowerCubes, High Performance Dimensional Cache, IBM Cognos Planning Real-Time Plans, Industry Standard OLAP: IBM, Microsoft, SAP BW, Essbase



The difference between 32-bit and 64-bit install packages



IBM Cognos BI v10.1.1 Business Intelligence product installation is available in 32-bit and/or 64-bit for a number of operating systems.



IBM Cognos BI v10.1.1 now includes 64-bit Report Service (DQM only). The default is 32-bit Report Service



The 64-bit installation package contains a combination of 32-bit and 64-bit components. The 64-bit configuration requires 64-bit JAVA and JRE setup



All Client elements (FM, Transformer) are available in 32-bit only



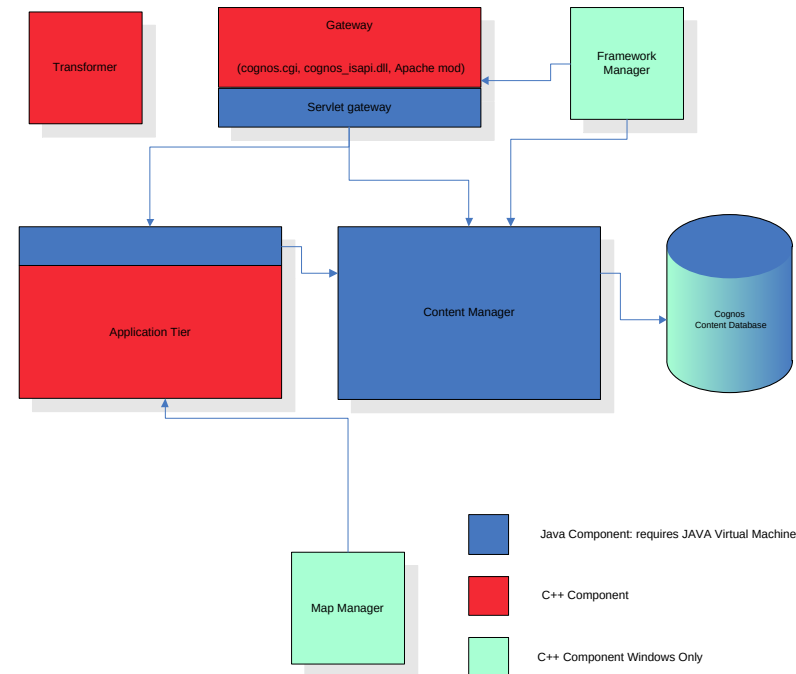
Metrics is now available in 64-bit



In the 64-bit media installations, the report server component, included with the Application Tier Components, is provided in both 32-bit and 64-bit versions.



In 32-bit installations, only the 32-bit version of the report server component is provided



Benefits of running IBM Cognos BI 10.1.1 64-bit vs. 32-bit?



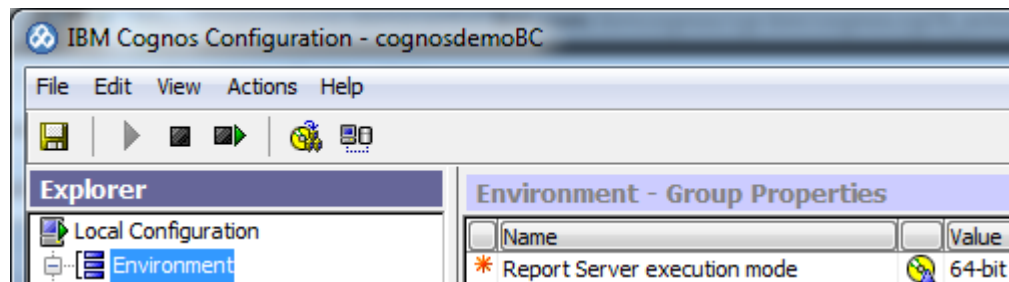
- Compliance and Compatibility with Environments
- Extended accessible memory per process on 64-bit platforms
 - 32-bit limit is 2 or 3 GB (*Depending on OS*)
 - 64-bit limit is unbounded
- IBM Cognos 10.1.1 64-bit can use unlimited RAM provided by hardware
 - 64-bit Reports Servers overcome RAM limitations





IBM Cognos BI v10.1.1 64-bit Report Service

- Choosing the appropriate Report Server bit type will depend on your application requirements.
- A given 64-bit BI Server install is able to run either the 32-bit or 64-bit report server but not both at the same time.
- The 32-bit Report Server includes the Compatible Query and can utilize the Dynamic Query capability.
- The 64-bit Report Server **does not include** the Compatible Query capability and is, therefore, able to utilize the Dynamic Query capability only.
- By default, all BI Servers are configured to use the 32-bit Report Server as it can run both Compatible and Dynamic queries.
- Routing Sets must be used if using a mixed 64-bit / 32-bit reporting environment

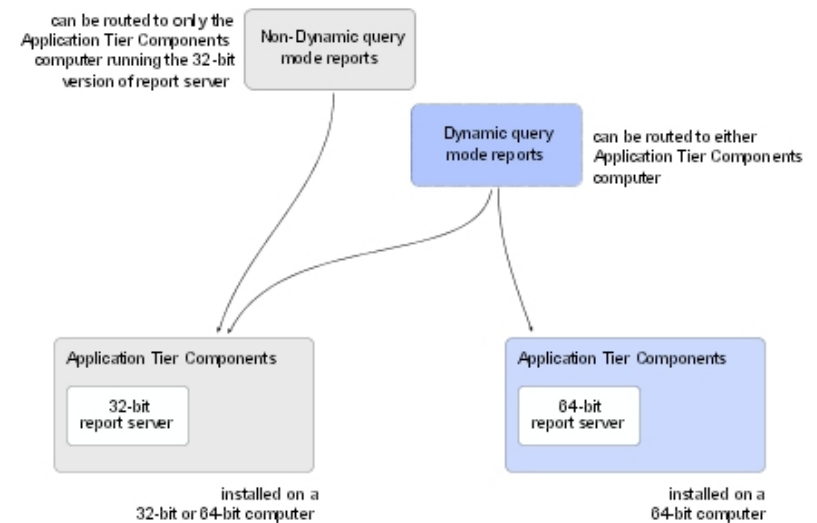




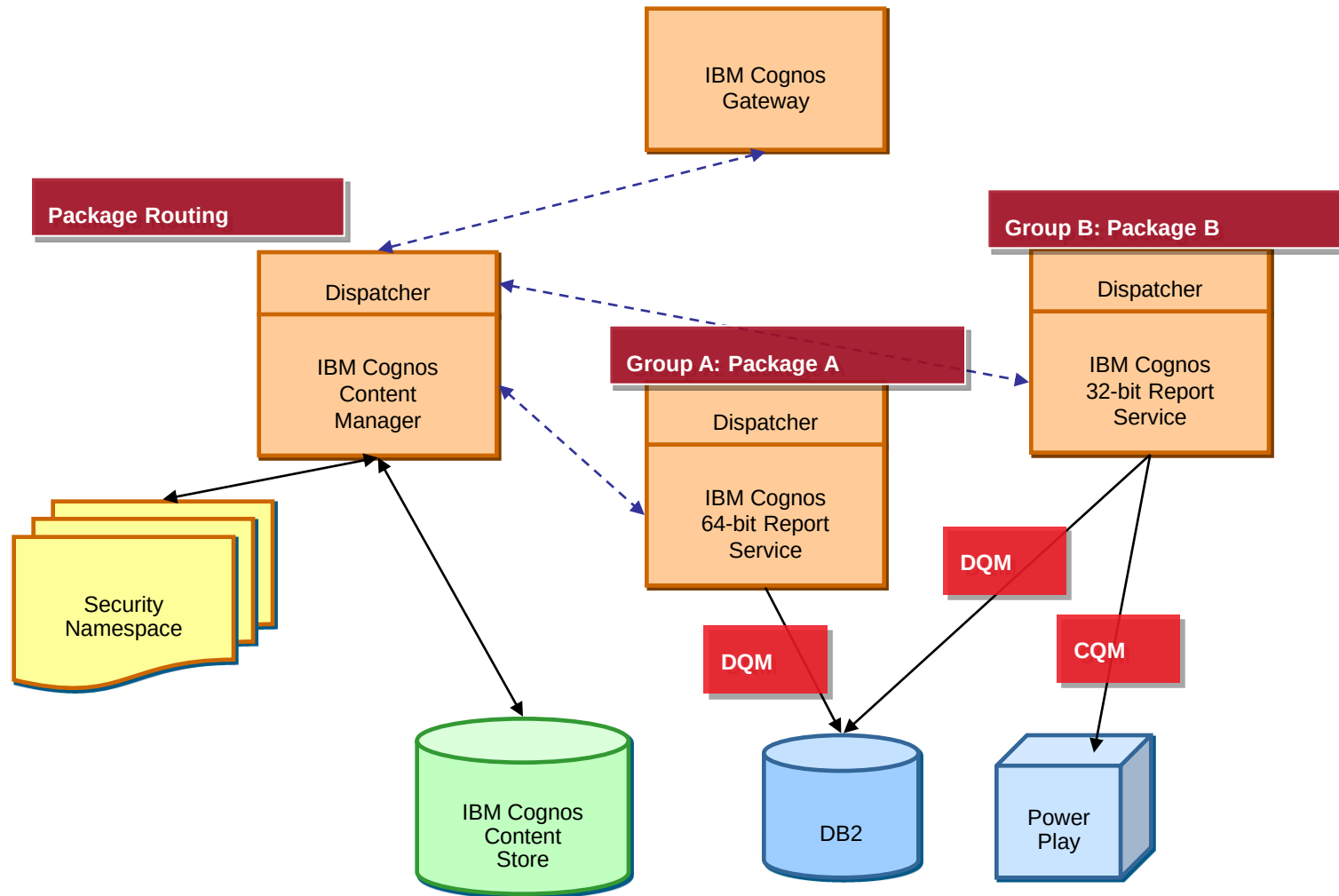
Using the 64-bit Report Service with Query Execution

Advanced Package Routing

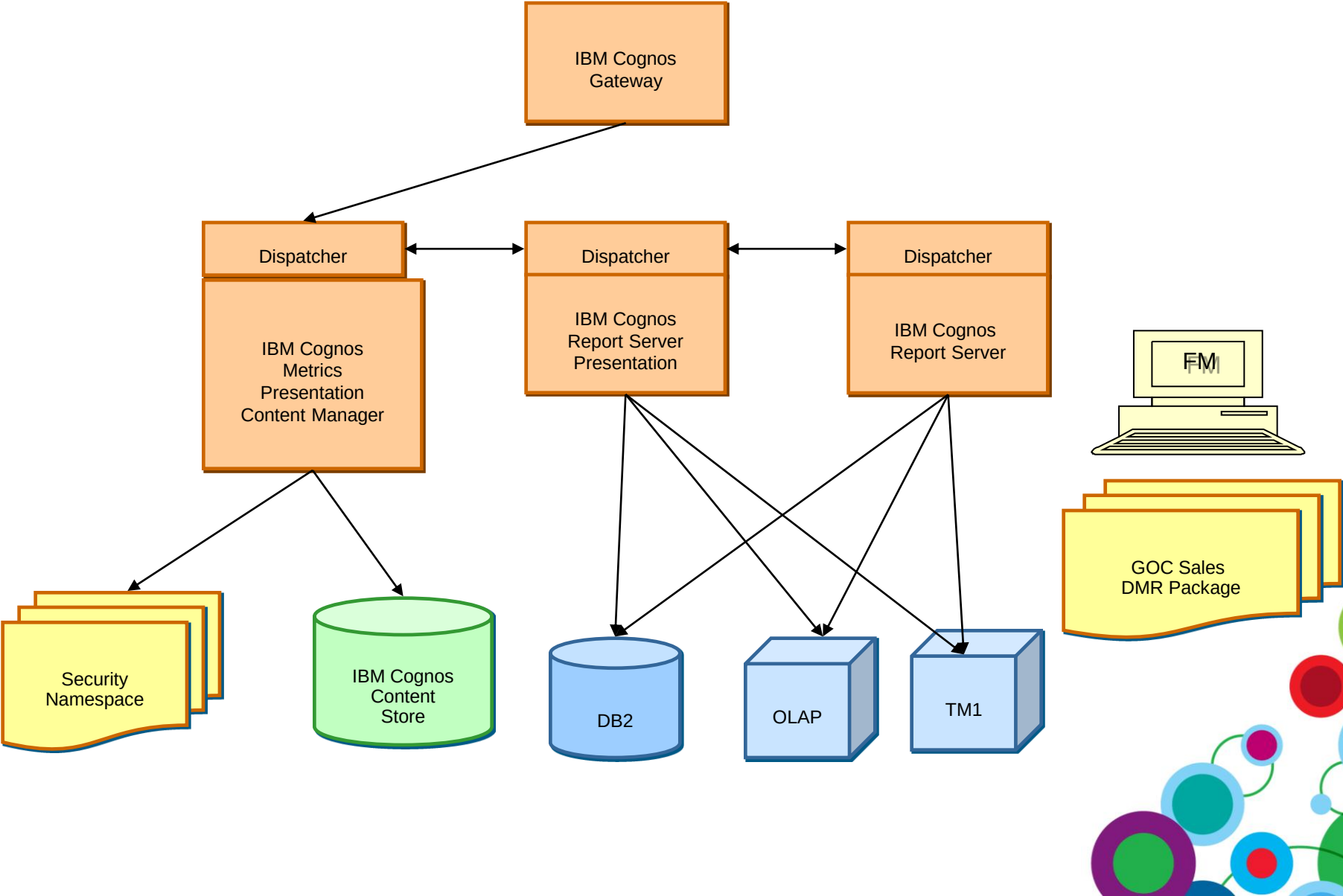
- To ensure that report execution requests (CQM vs. DQM) are directed to the appropriate BI Server(s).
- If package routing is not set, what server will execute the DQM?
 - The compatible query request may be send to a 64-bit Report Server, so the request would fail.
 - The complex requests from a DQM query may not run in the 32-bit Report Server, as 32-bit memory allocation may not be sufficient to complete the request.
- To ensure that report execution requests (CQM vs. DQM) are directed to the appropriate BI Server(s).
- If package routing is not set, what server will execute the DQM?
 - The compatible query request may be send to a 64-bit Report Server, so the request would fail.
 - The complex requests from a DQM query may not run in the 32-bit Report Server, as 32-bit memory allocation may not be sufficient to complete the request.
- Need to define the 64-bit Report Service running as a Server Group (A) and 32-bit Report Servers as another Group (B)
 - Assign DQM Package to Server group A
 - Assign Compatible package to Server group B
- Package routing has been in the product since IBM Cognos 8.1



New 64-bit Report Service in use



Sample Scenario: Great Outdoors Company IBM Cognos 8



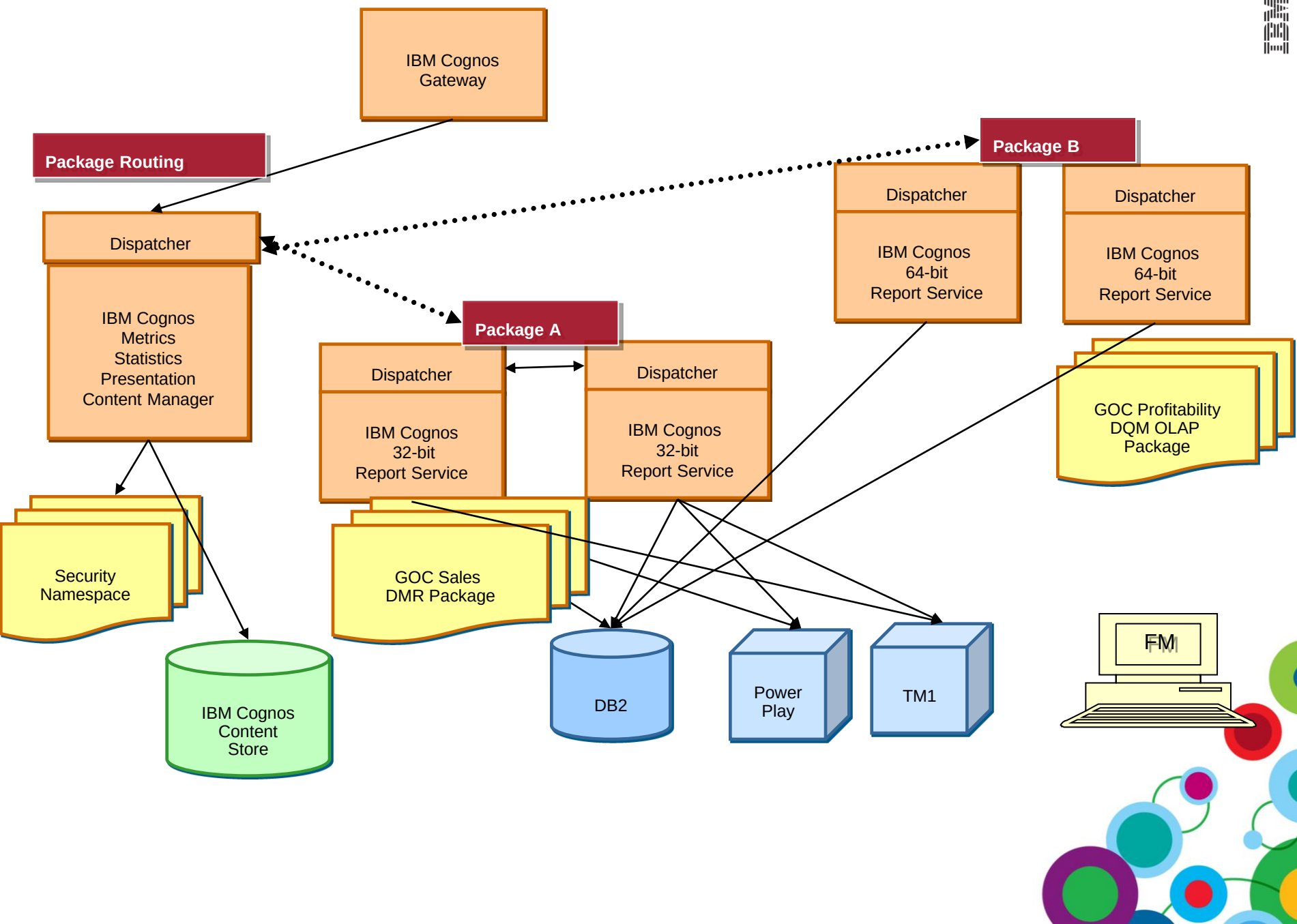


Great Outdoors Company

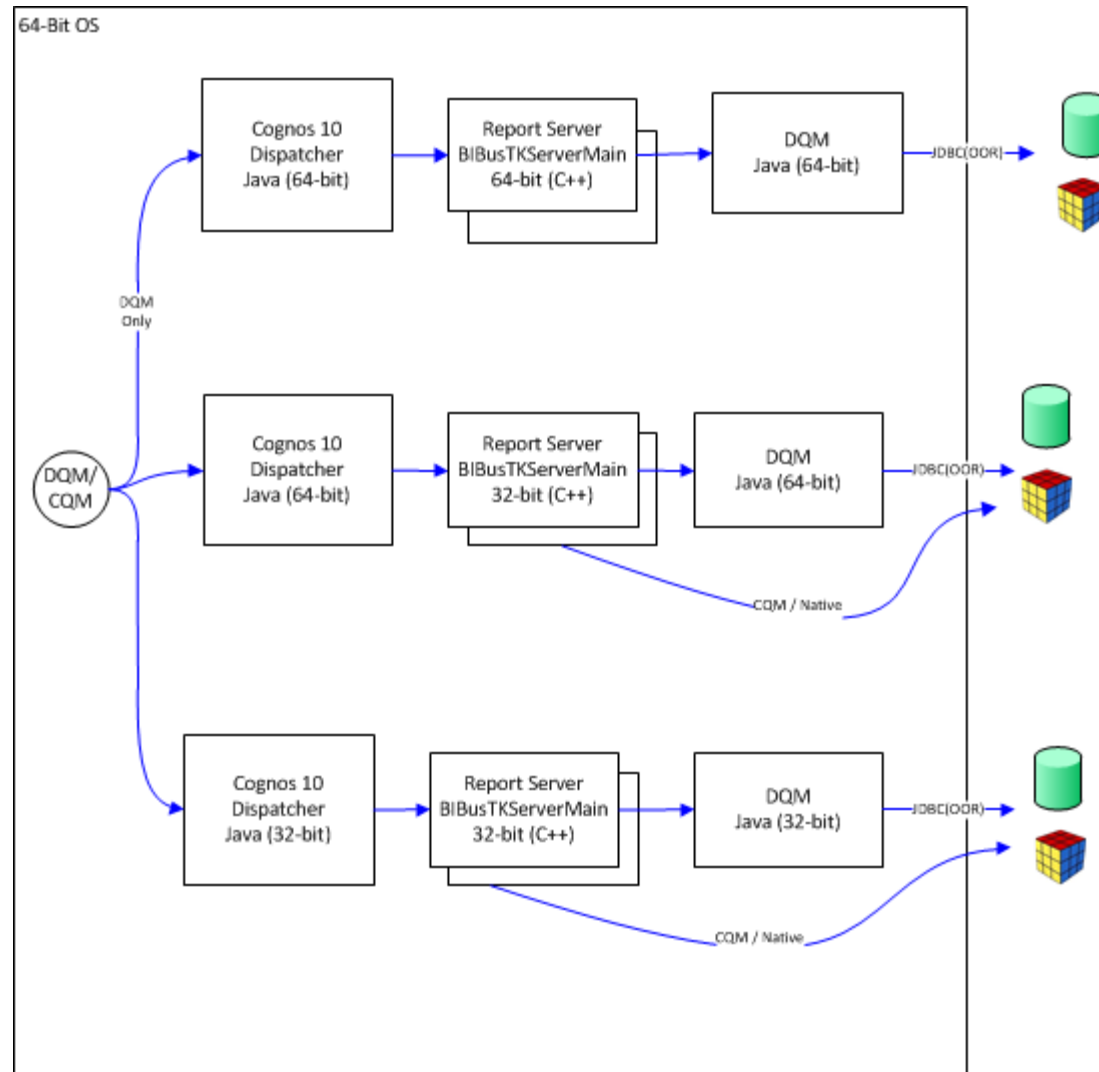
- Gather requirements for Application –GOC based
 - Discuss data sources and data models available
 - Describe the existing Infrastructure of system
 - Determine business analytical needs
- The Great Outdoors company have been using DMR since Cognos 8 and want to migrate to OLAP over Relational
- The Great Outdoors company has IBM Cognos PowerPlay, DB2 and IBM Cognos TM1 as it data sources
- The Great Outdoors company have purchased 2 new 64-bit servers to add to their existing infrastructure because usage statistics on existing servers shows performance strains on the existing 32-bit BI servers
- The Great Outdoors company want you to create an Application map to understand how they will implement the OLAP over Relational migration from their existing DMR packages against their DB2 data sources



With 64-bit Servers added



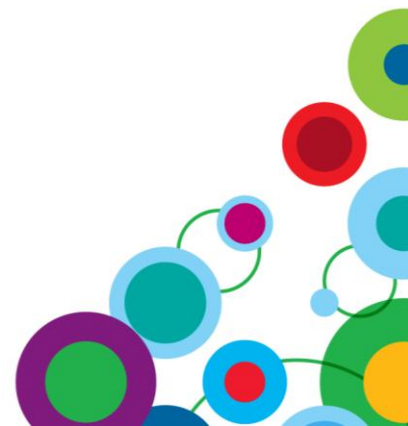
64-bit Operating System – Process Flow



What are the requirements to install a 64-bit version of the product ?

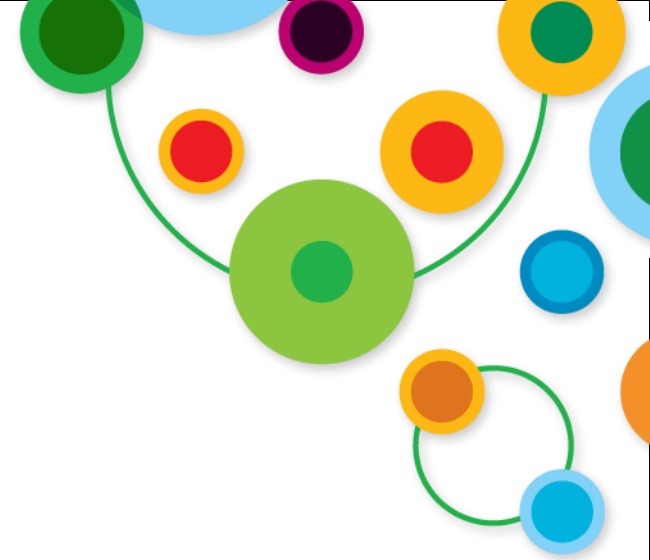


- A supported 64-bit Operating System refer to <http://www-01.ibm.com/support/docview.wss?uid=swg27019126#os>
- A supported 64-bit JAVA application server refer to http://www-01.ibm.com/support/docview.wss?uid=swg27019126#app_servers
- A supported 64-bit JRE (if running Apache Tomcat, else JRE is part of the Application Server) refer to http://www-01.ibm.com/support/docview.wss?uid=swg27019126#java_runtime
- DQM access requires the appropriate type 4 JDBC driver
- The usage of the IBM Cognos BI v10.1.1 64-bit install package.
- Setting 64-bit Server Environment property in Cognos Configuration
 - For performance reasons Do not separate the Report Service and DQM
 - Increased network traffic that is not needed



IBM Cognos 10.1.1 Infrastructure

System Management Methodology and JMX





System Monitoring

IBM Cognos Administration

Sam Carter Log Off | Home | Launch ? IBM.

Status Security Configuration Index Search

Current Activities
Past Activities
Upcoming Activities
System
Schedules

Scorecard

All dispatchers

Name	Status
System	Available
Content Manager:9500	Available
Report Server:9600	Available

Metrics - System

0 0 9 No metric score

Name	Value
Job queue	
JVM	
Process - Batch report service	0 0 1
Process - Graphics service	0 0 1
Process - Metadata service	0 0 1
Process - Report service	0 0 1
Queue - Report service	0 0 2
Request	0 0 1
Request - Agent service	0 0 1

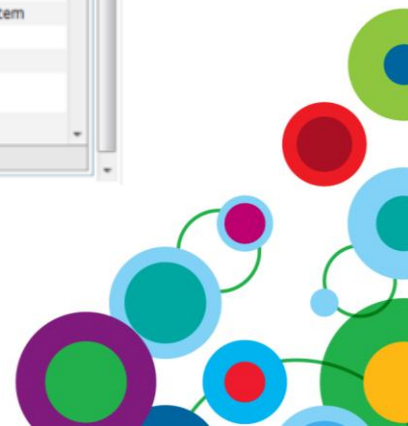
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Settings - System

Name	Value
Environment	
Administrator Override	
Logging	
Tuning	
Processing capacity	1.0
Load balancing mode	Weighted Round Robin
Temporary objects location	Server File System
Temporary objects lifetime	4 Hour(s)
Server group	
Number of high affinity connections for the batch report service during non-peak period	1
Number of low affinity connections for the batch report service during non-peak period	2

Last refresh time: October 20, 2010 6:59:30 PM

- Glimpse into the 'health' of the environment
- Hundreds of application metrics
 - Ability to define thresholds
 - Can be tracked over time
- Flexibility to define customize monitoring based on business requirements
- Based on Java Management eXtensions (JMX)





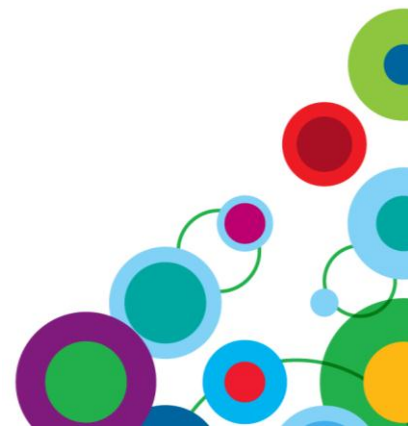
How to Externalize IBM Cognos System Metrics

- Externalize Cognos BI system metrics via JMX into a monitoring tool, such as Tivoli Monitoring

The screenshot displays the IBM Cognos Administration console. On the left, the 'MC4J Connections' tree is expanded to show the 'Attributes' section under 'com.cognos'. The 'Metrics' sub-section is selected, showing a list of metrics including 'Seconds per successful request'. On the right, the 'Request' table displays various system metrics. The 'Seconds per successful request' metric is highlighted with a red box, showing a value of 0.03s. Below the table, the 'Properties' section for 'MillisecondsPerSuccessfulRequest' is shown, with the 'Editable' property set to 'true' and the 'Value' set to '30'. Red arrows indicate the relationship between the metric in the table and its properties.

Name	Value
Last response time	0.016s
Number of failed requests	0
Number of processed requests	4,588
Number of successful requests	4,588
Percentage of failed requests	0%
Percentage of successful requests	100%
Response time high watermark	0.781s
Response time low watermark	0.0s
Seconds per successful request	0.03s

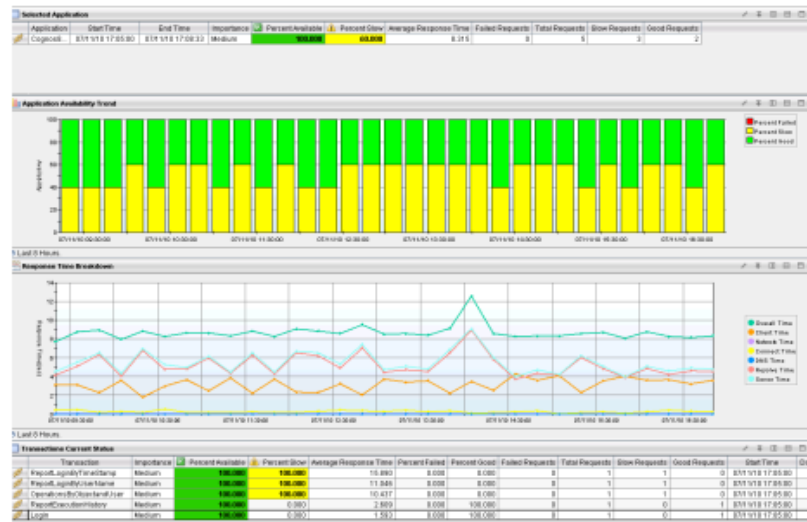
MillisecondsPerSuccessfulRequest - Properties	
Attribute Name	MillisecondsPerSuccessfulRequest
Description	Calculated
Class Name	long
Editable	true
Value as String	30





How to Externalize IBM Cognos System Metrics

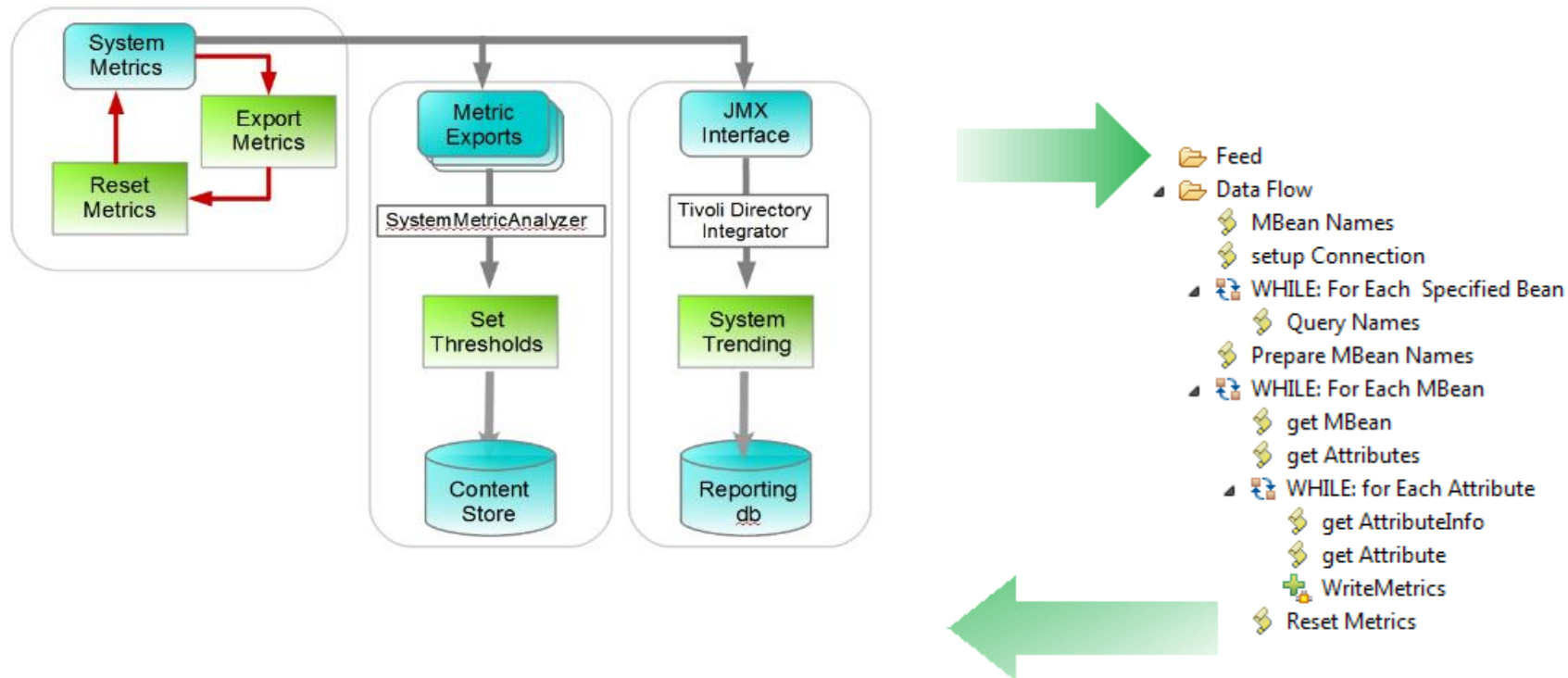
- System metric monitoring via JMX
 - Use Tivoli agent to read JMX metrics from Cognos
- System event monitoring via Cognos logs and audit information
 - Cognos resource monitoring using a Tivoli Agent Builder agent
- JVM Resource Monitoring
 - Tivoli ITCAM for Application Diagnostics
- System Resource Monitoring
 - Tivoli Monitoring for OS





System Metric Trending – Loading a BI Reporting Warehouse

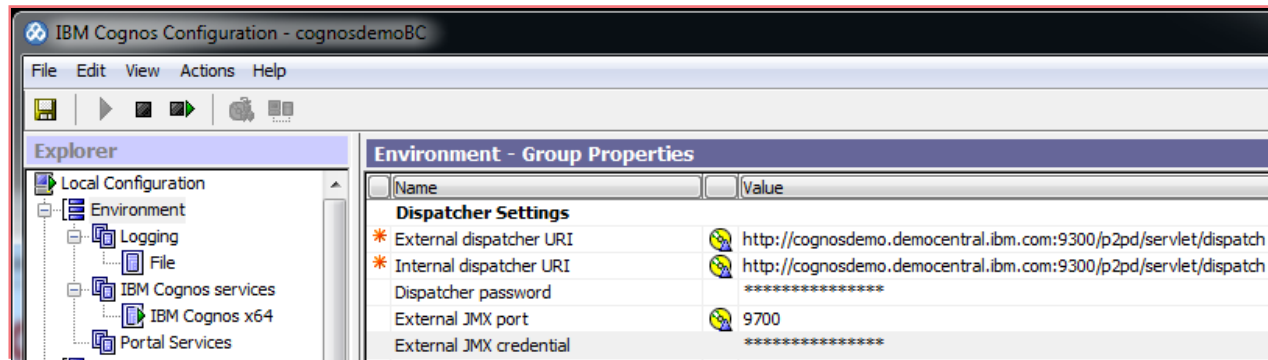
- System metrics provide additional insight opportunities
- Workflow for default thresholds and system trending



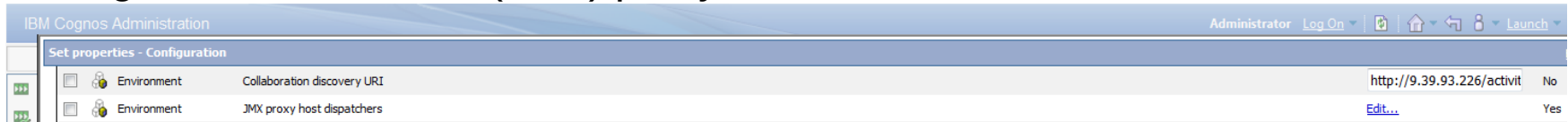


Specify the JMX Proxy Server Host

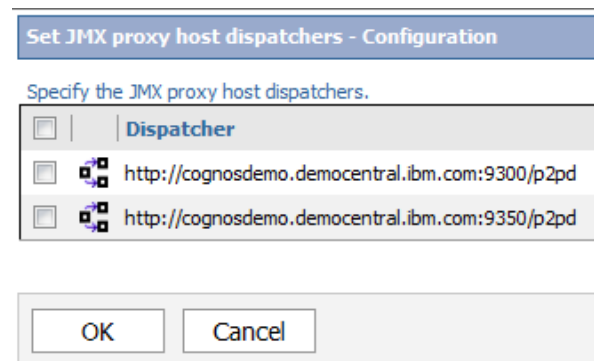
- JMX is now enabled by default. Set the port number to listen on port 9700



- Create a list of one or more dispatchers that are available to host the Java Management Extensions (JMX) proxy server



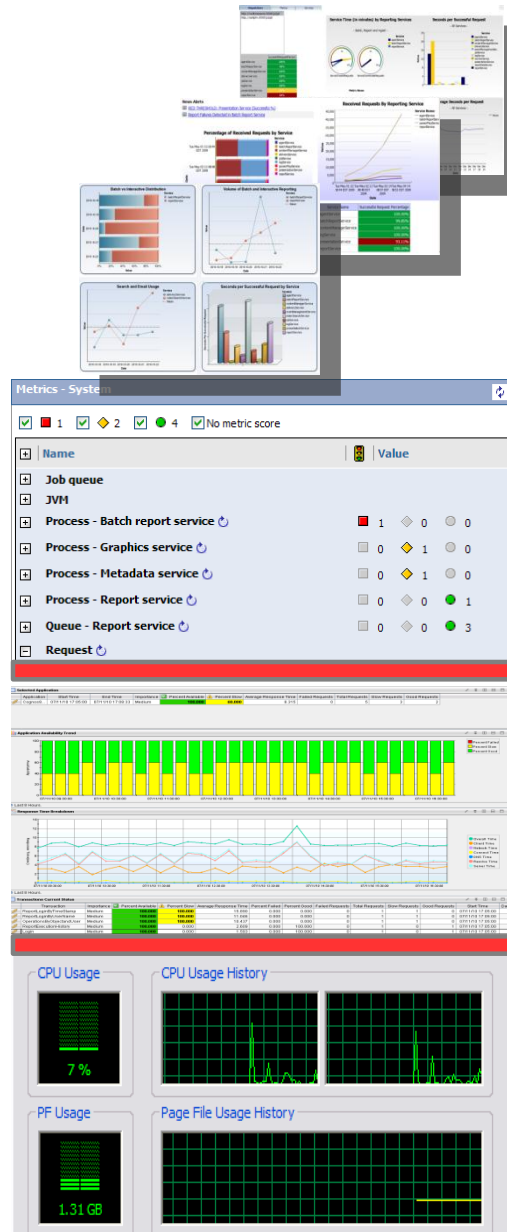
- The dispatcher that is at the top of the list and is currently running is the dispatcher that is chosen as the host.
- This helps reduce the number of threads required to collect JMX metrics



How to complete the picture



- Cognos Servers
- Web Servers
- Application Servers
- Database Servers
- LDAP Servers
- Network Infrastructure



BI for Administrators

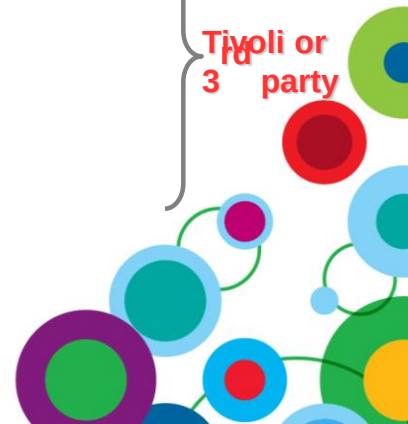
System Metric Thresholds

Resource Monitoring

Component Tooling

SMM

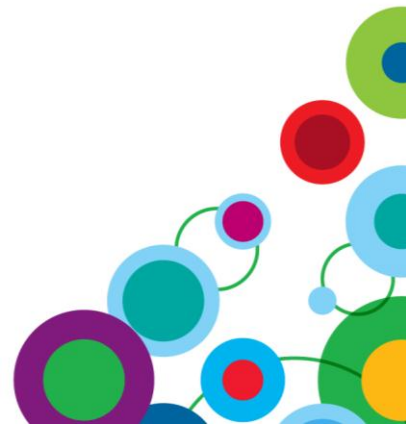
Tivoli or 3 party





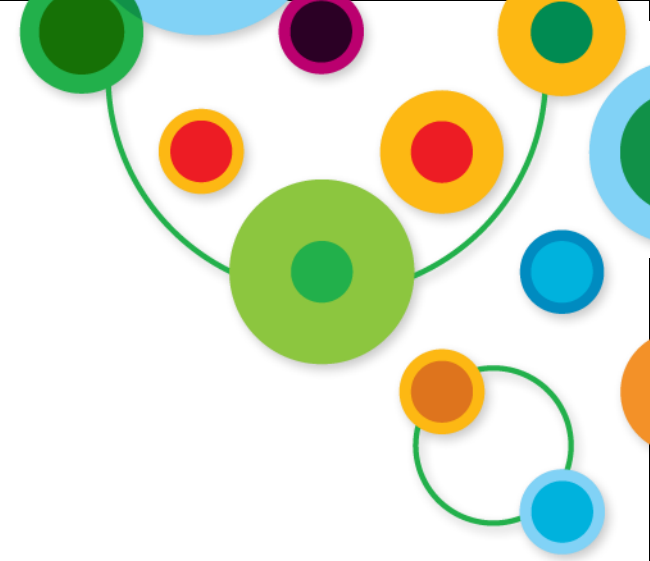
Logging to Diagnose a Problem for a Specific User

- Diagnose a problem that is occurring for one or more specific users.
- Temporarily set logging to occur for the specified users only.
- Enable and disable logging for specific users by using the Remote Process service for JMX.
- You connect to the JMX Remote Process service using the Jconsole (provided with the Java JDK). By default, output from the user-specific logging is saved in the `c10_location\logs` directory.



IBM Cognos 10.1.1 Infrastructure

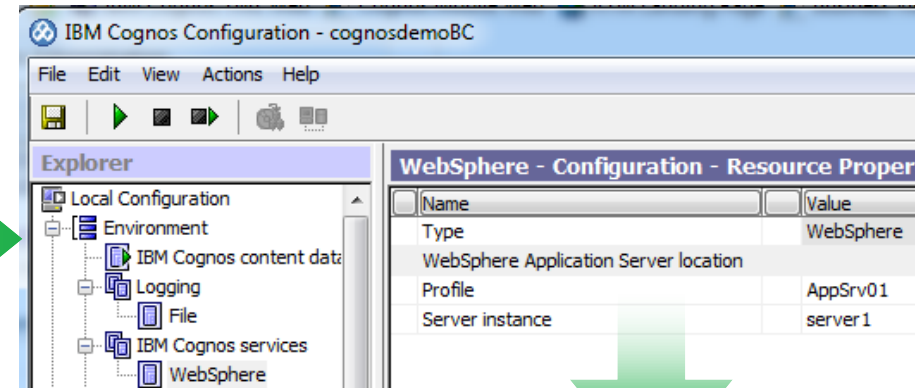
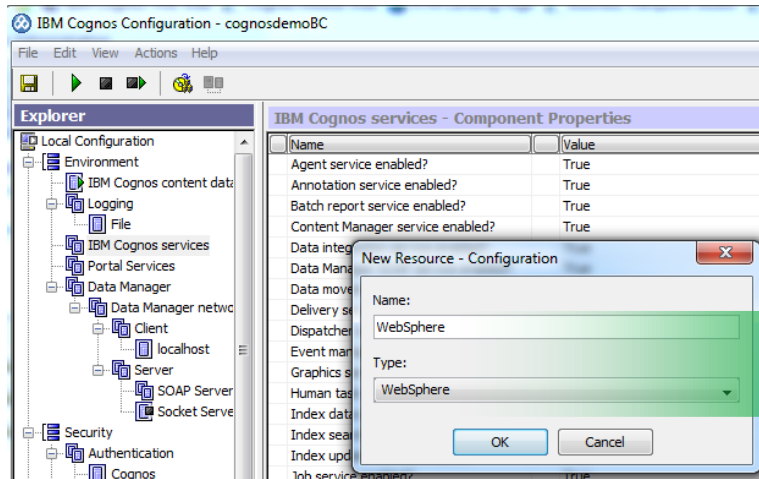
IBM Integration with DB2 DDL, WebSphere and FileNet



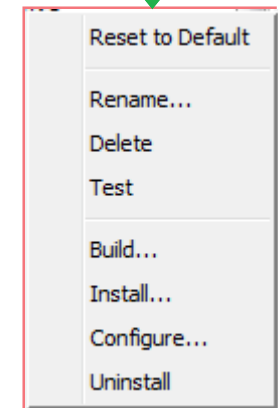


Automatically Deploy to IBM WebSphere

- Define a WebSphere Service



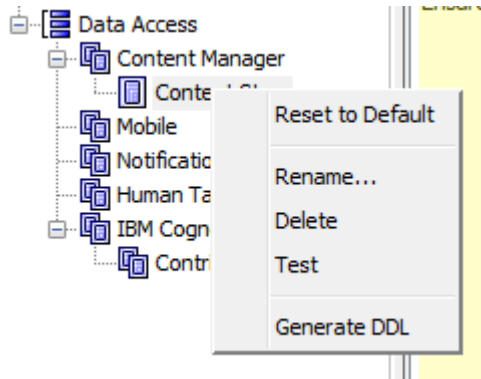
- Add WebSphere Connection Credentials
- Select build to display the “Build” dialog box
- Configure server name(s) and port(s) if required



Generate a script for a content store for IBM DB2

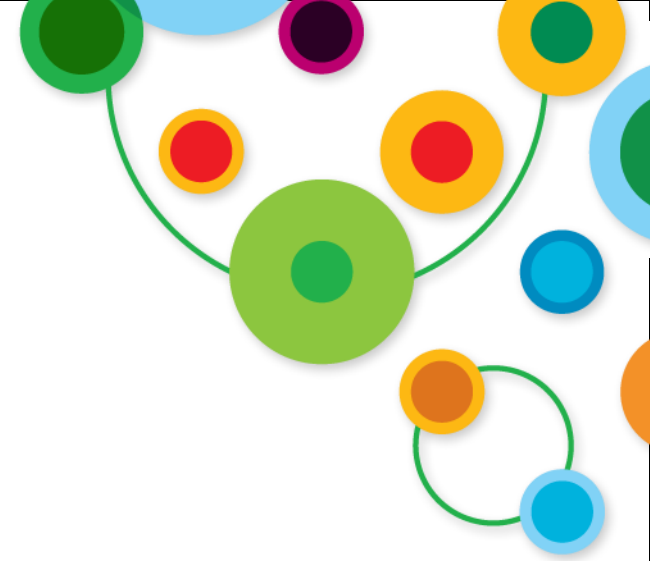


- Use IBM Cognos Configuration to generate a DDL file that you can use to create a content store in IBM DB2.



IBM Cognos 10.1.1 Infrastructure

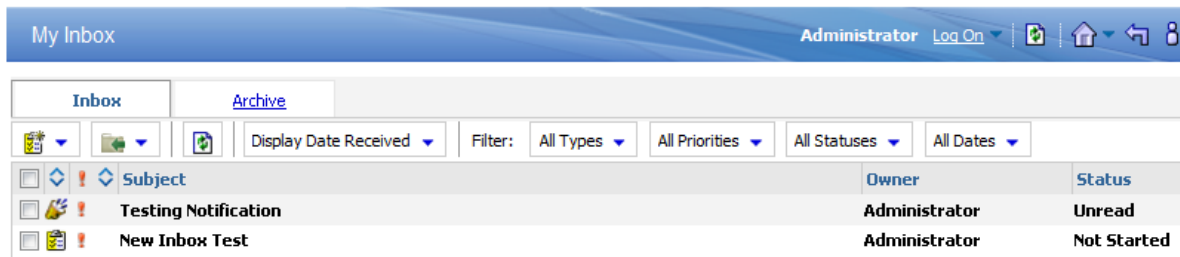
- **Human Task Service and Annotation Service**



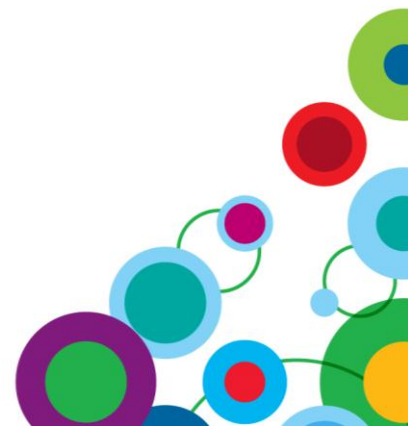


My Inbox – New

- Three types of human tasks you can see in the task inbox:
 - approval requests
 - ad-hoc tasks
 - notification requests.
- Tasks can be created from
 - Event Studio (notification requests and approval requests)
 - My Inbox area of IBM Cognos Connection (notification requests and ad-hoc tasks)
 - A watch rule set up for a report (notification requests only).
- Open Tasks by
 - IBM Cognos BI Welcome Page
 - IBM Cognos Connection Preferences
 - IBM Cognos Administration

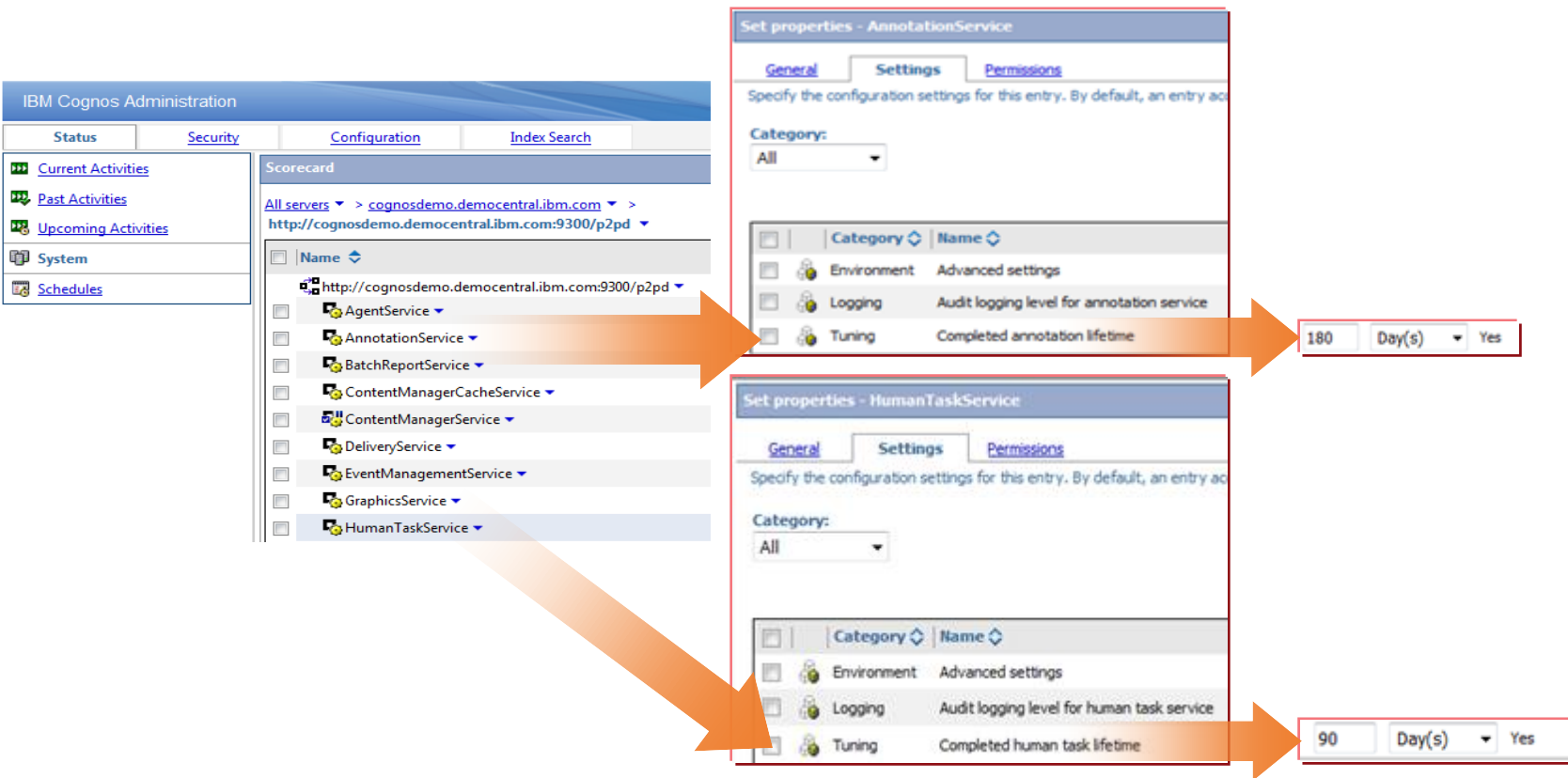


	Subject	Owner	Status
☐	Testing Notification	Administrator	Unread
☐	New Inbox Test	Administrator	Not Started



Set Lifetime of Completed Human tasks and Annotations

- Set the lifetime of completed annotations and human tasks
 - This is the lifetime after the associated entry is deleted.
 - The default lifetime is 90 days for completed human tasks and 180 days for completed annotations



The screenshot displays the IBM Cognos Administration console. On the left, the 'Configuration' tab is active, showing a tree view of services. The 'AnnotationService' and 'HumanTaskService' are highlighted. Two orange arrows point from these services to their respective configuration windows.

AnnotationService Configuration:

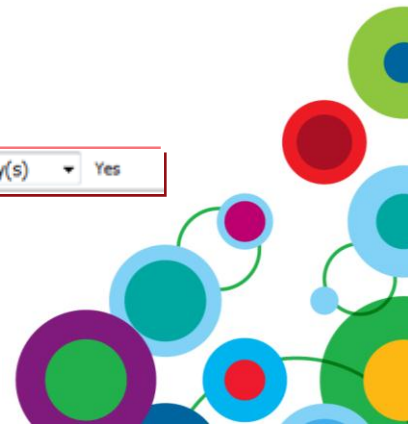
- Category: All
- Environment: Advanced settings
- Logging: Audit logging level for annotation service
- Tuning: Completed annotation lifetime

The 'Completed annotation lifetime' is set to 180 Day(s) Yes.

HumanTaskService Configuration:

- Category: All
- Environment: Advanced settings
- Logging: Audit logging level for human task service
- Tuning: Completed human task lifetime

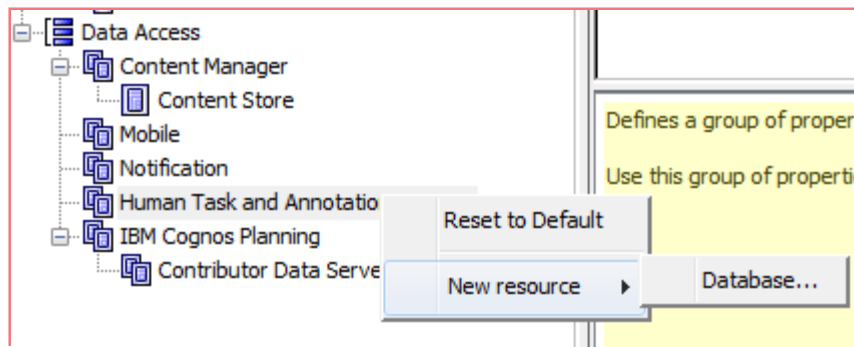
The 'Completed human task lifetime' is set to 90 Day(s) Yes.





Deploy Human Task and Annotation Services

- Content for the Annotation and Human Task services are stored separately from the main Content Store
- The Content is deployed using scripts rather than the deployment tool
- To Export use:
 - `htsDeployTool -camUsername camUsername -camPassword camPassword -camNamespace camNamespace -exportFile exportFileName -password exportFilePassword`
 - *To export annotations, add the argument `-persistenceUnit annotations`*
- This will create a file `<exportFileName>.xml.gz` created in `c10_location/deployment`
- To Import use:
 - `htsDeployTool -camUsername camUsername camPassword -camNamespace camNamespace -importFile importFileName -password importFilePassword`





Human Task and Annotation Services Audit Logs

- New Audit entries have been created for Annotation and Human Task logging

COGIPF_ANNOTATIONSERVICE	Stores audit information about Annotation service operations
--------------------------	--

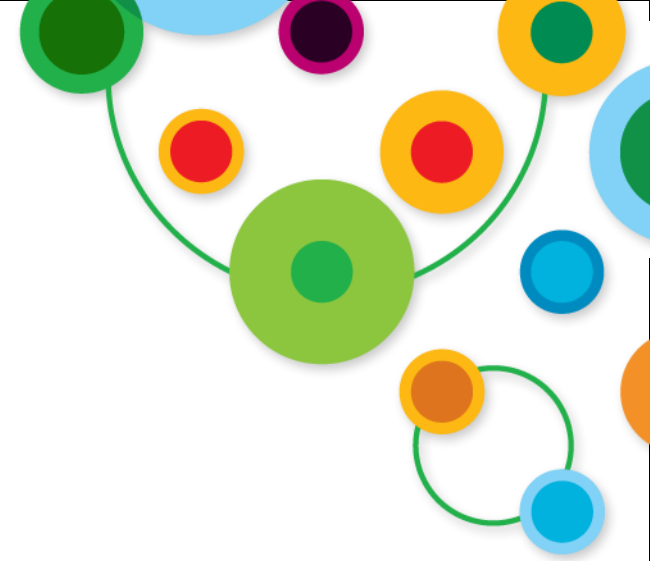
COGIPF_HUMANTASKSERVICE	Stores audit information about Human Task service operations (tasks and corresponding task states)
COGIPF_HUMANTASKSERVICE_DETAIL	Stores additional details about Human Task service operations (not necessarily required for every audit entry, for example, notification details and human role details)



IBM Cognos 10.1.1 Infrastructure

- **Dynamic Query Mode (DQM)**

Who should use Dynamic Query?





Who should use Dynamic Query?

Dynamic Query provides unique opportunities for IT to better service their clients



- 64-bit, Java based query service



- In-memory processing and data cache



- Enhanced query performance and usability

Dynamic Query enables delivery of applications that delight Business users



- High performance executive dashboards delivering insight into the business



- Gain insight from greater volumes of data coming from disparate data sources.



- Access to the information they need in a timely manner





Who Built Dynamic Query?

- Dynamic Query was initiated by 6 major architects
Over 4 years of elapsed effort (started Nov, 2007)
- Employees from 6 IBM labs contributed to different areas
- Development teams run 500,000 automated tests/day performed on this code alone
 - 4 times the # of 'testing' lines of code
 - Over 130 million distinct tests have been run to date





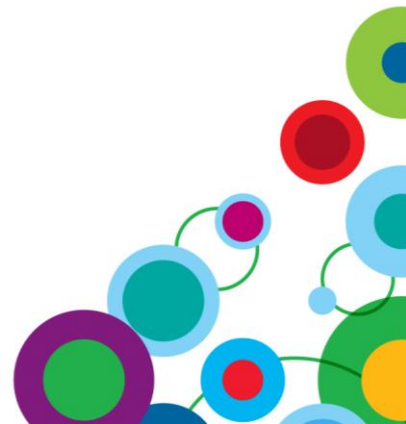
Why Did IBM Cognos Build Dynamic Query?

Primary **Business Drivers** for Dynamic Query:

- Improve query performance for all users
- Build a 64-bit solution stack
- Utilize new hardware more effectively
- Reduce TCO for customers and IBM
- Provide a smooth surface for Analysis – Consistent OLAP interface

Additional considerations

- Enhance analysis without additional OLAP containers
- Support for modern data sources

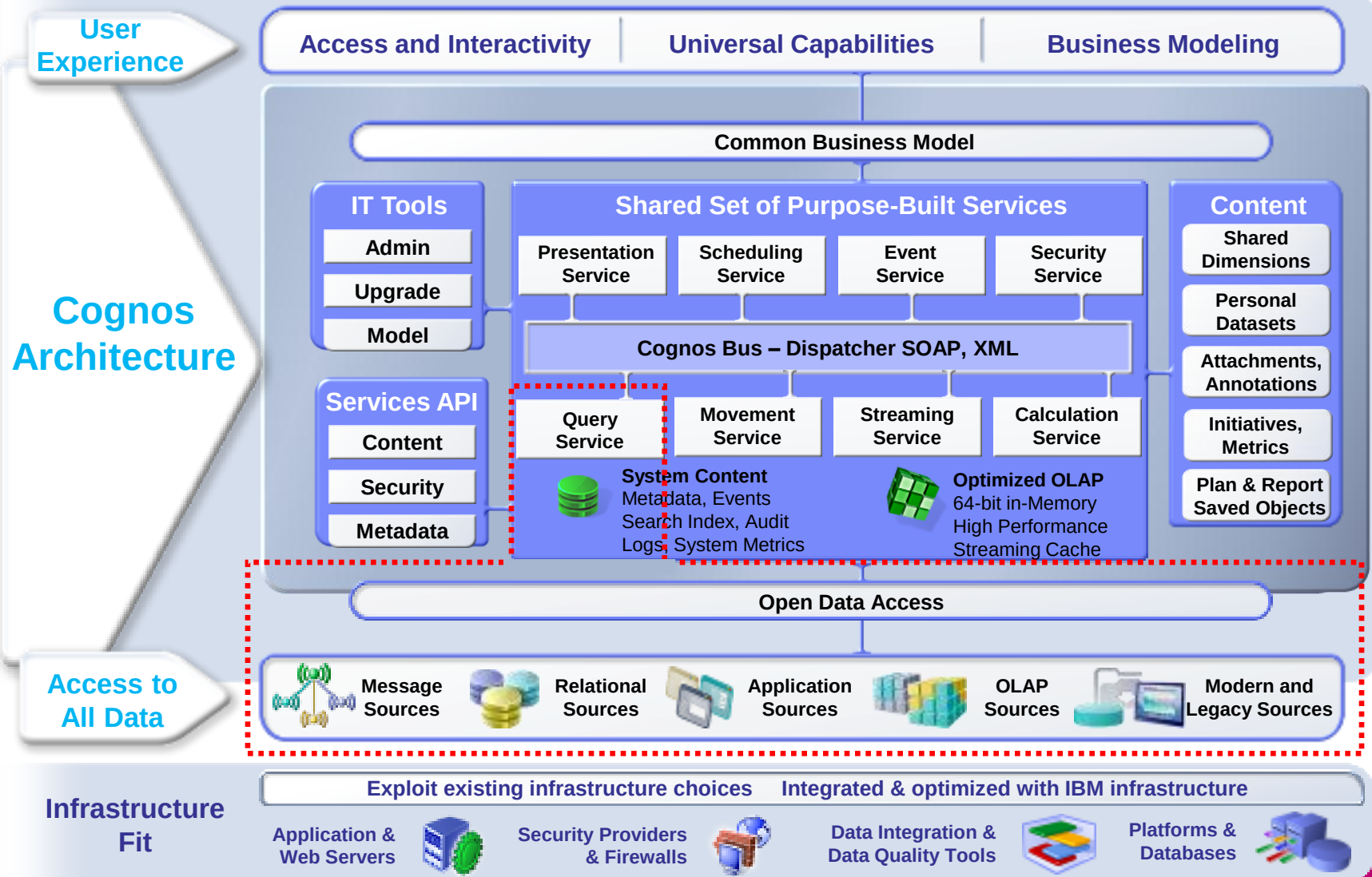




What is Dynamic Query and Dynamic Query Mode?



Dynamic Query Mode and the existing Query Service

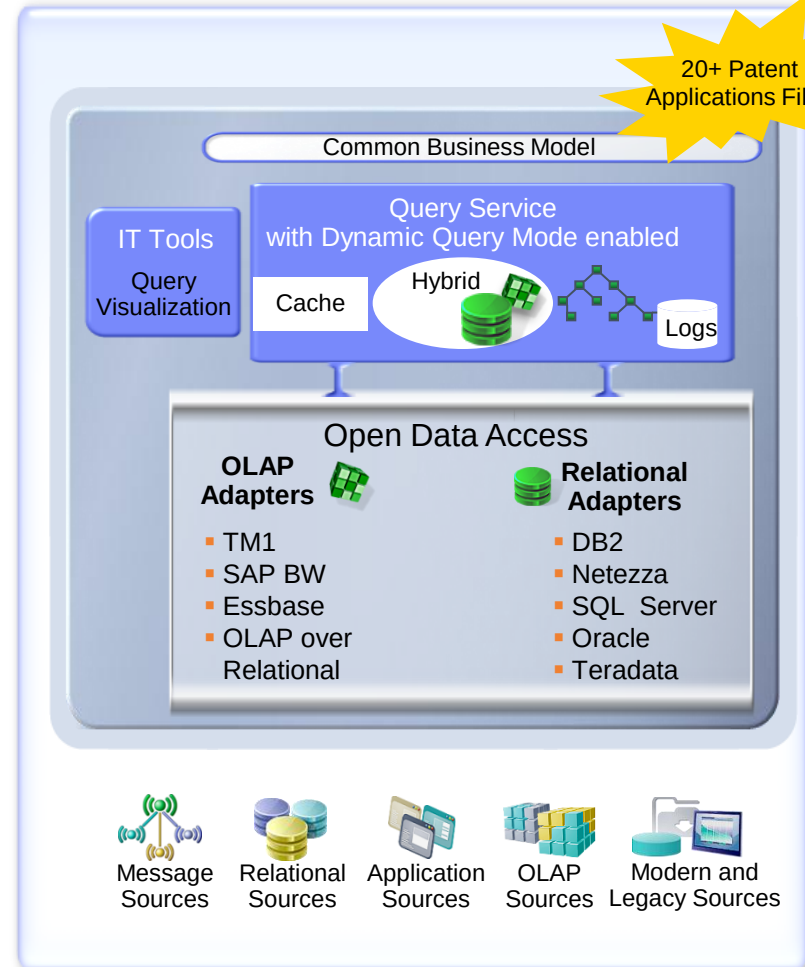


What is Dynamic Query?

- A new Dynamic Query processing 'mode' (DQM) to the existing query service designed to improve query performance
 - Can be used with or in place of existing compatible query service
- Contains new query engine which:
 - Leverages 64-bit architecture
 - Optimized query processing
 - Security aware caching
 - Built-in query visualization tool
 - JDBC connectivity to relational sources



20+ Patent Applications Filed



TM1, SAP BW, Essbase, OLAP over Relational (DMR)



DB2 (LUW and Z), Netezza, Microsoft SQL Server, Oracle, Teradata

New!



Works with BI Reporting and Analysis Studios

Works with BI Reporting and Analysis Studios

- Business Insight
- Business Insight Advanced
- Report Studio Professional
- Active Reports (for initial retrieval)
- Café
- Query Studio
- Analysis Studio

Use with other IBM Cognos products varies

- When introducing DQM ensure compatibility with older application





Leverages 64-bit architecture

64-bit does not provide:

Improved query performance on its own

- CPUs are slightly faster and have slightly faster memory access

64-bit does provide:

Access to more memory

- DQM has access to more addressable memory
- DQM can have a lot more caching and that enables performance

Retain cache as long as necessary: day, week, month...

- DQM can hold onto things longer in memory to be leveraged over and over

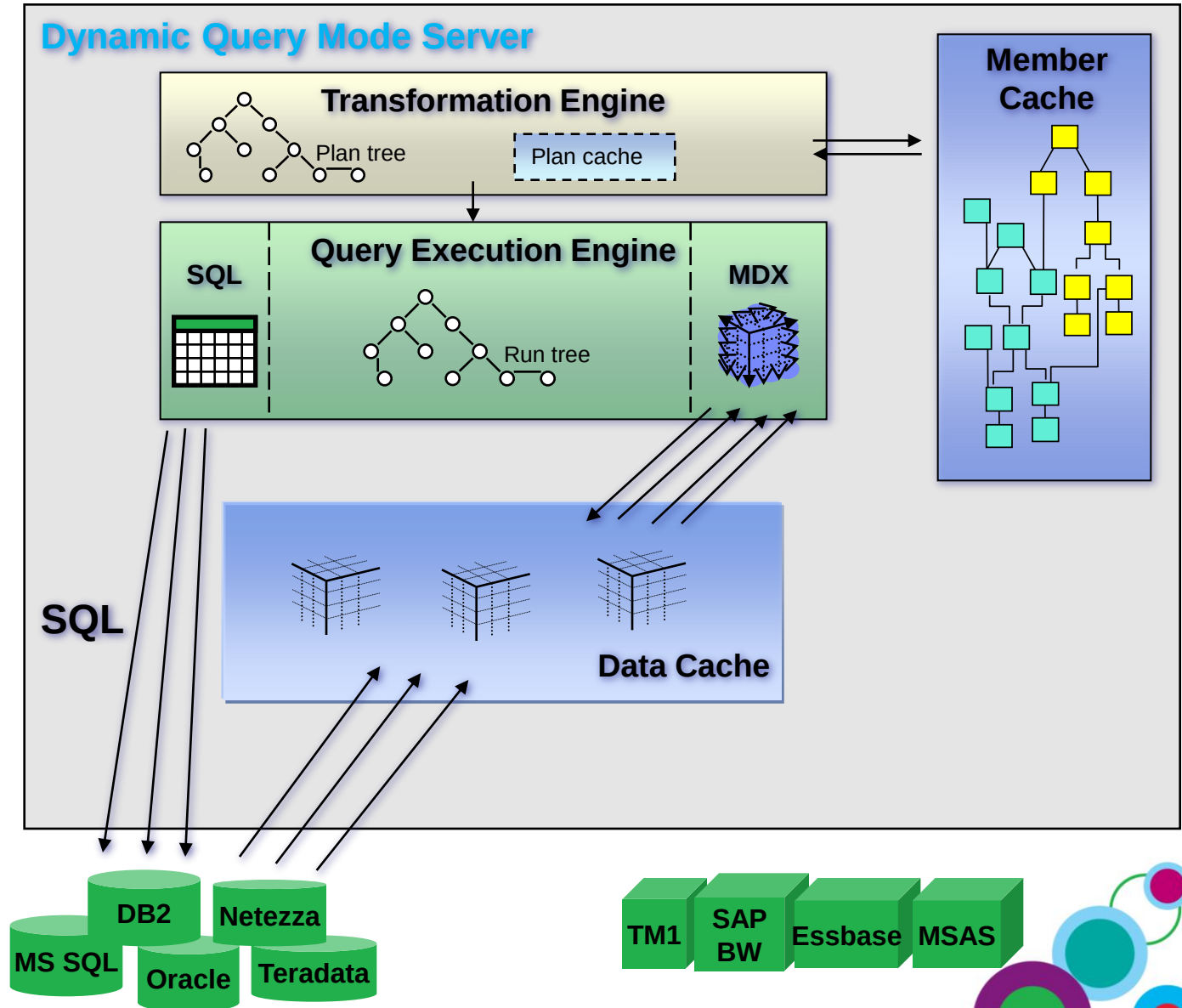


Query processing overview



Report
Request

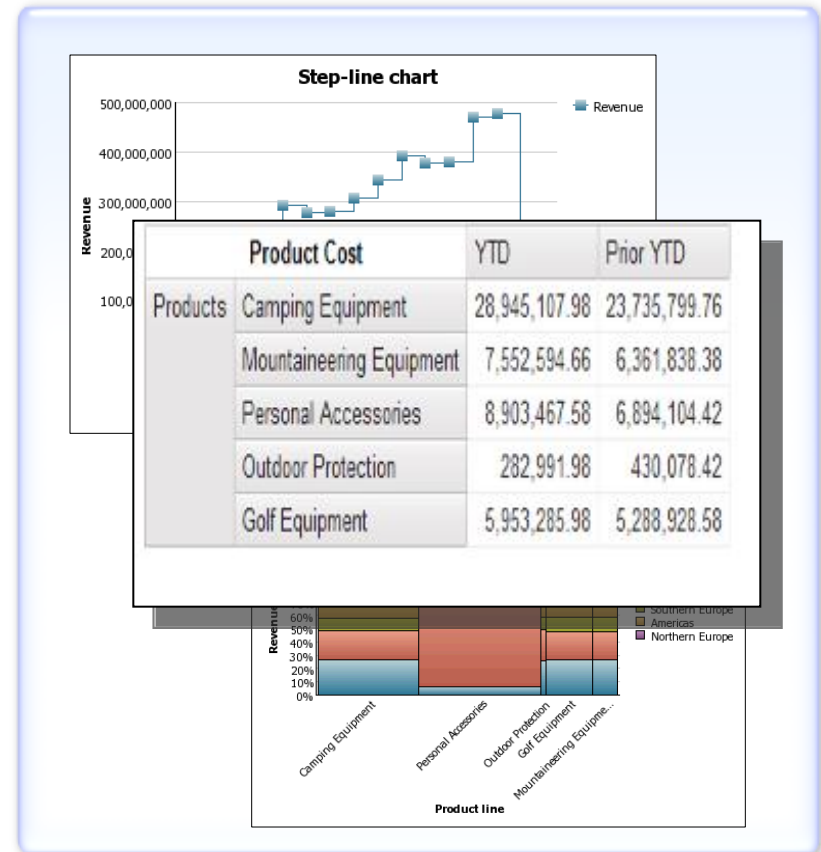
Result
Set





Security Aware Caching

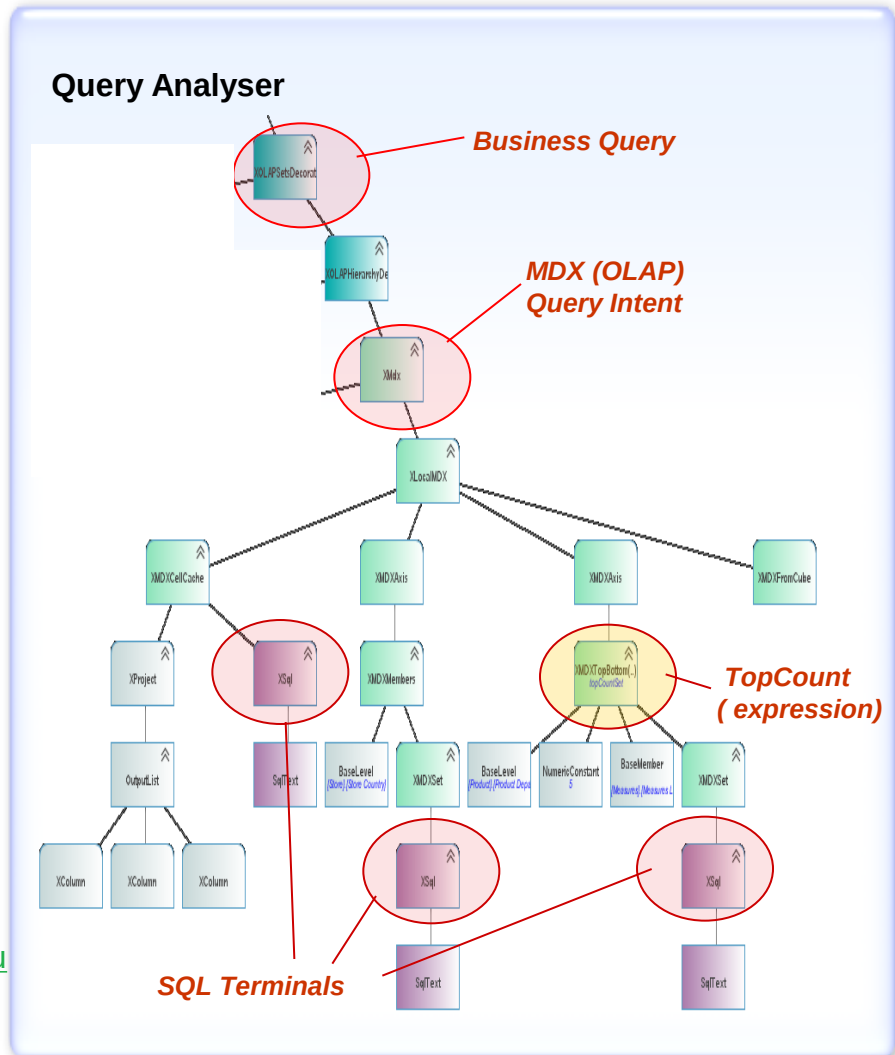
- Security aware cache
 - Security profiles are tracked as query plans are created
 - Members and data are populated into cache as queries are executed
 - Data is retrieved from cache if it exists and if security profiles match
- Manipulate data results without re-query
 - Caching of facts, members, metadata and query plans
 - Moving columns, applying formatting
- Quickly interact with the information
 - Filter, sort or change display and output formats
- TM1 – Has it's own data caching
- Supports but does not require 64-bit processing



Ease maintenance with Dynamic Query Analyzer

- **Visual display of result flow** to easily troubleshoot dynamic query issues and resolve problems quickly
- **Easy access to logs remotely from dynamic query analyzer** to reduce maintenance time
- **Ability to run reports from dynamic query analyzer** to increase IT efficiency
- **DQA Cookbook:**

http://www.ibm.com/developerworks/data/library/cognos/infrastructure/cognos_specific/page578.html





Why would I use Dynamic Query?



Why Use Dynamic Query?

Improved query performance!

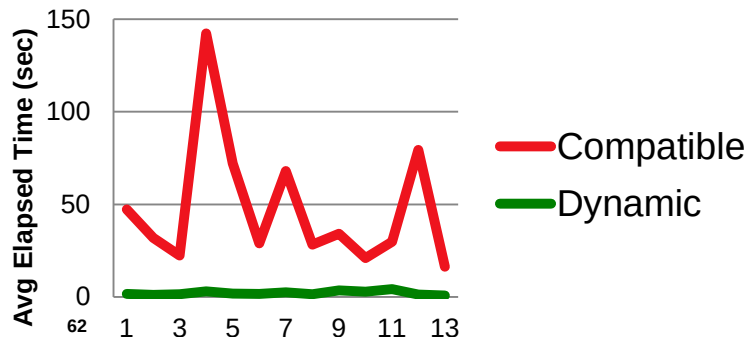
Dynamic Query has been designed and developed to provide high performance query results through:

- Optimized, multi-phase SQL query
- Metadata, query plan and query result re-use
- Shareable caches providing in-memory, balanced local processing
- Hybrid query request processing

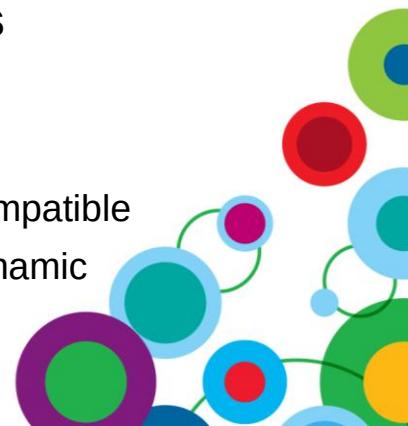
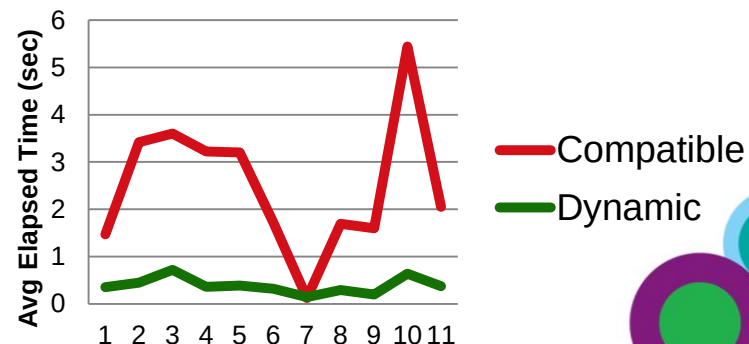
Specific data sources show dramatic performance improvements in Performance Lab Testing

- TM1 – Tighter integration resulting in performance gains
- SAP BW – In memory processing and data cache
- Essbase – Total average elapsed time from over 22 to under 5 minutes
- OLAP over Relational (DMR)
- MSAS – 40% overall performance improvement

Essbase on AIX 64



SAP BW on Windows

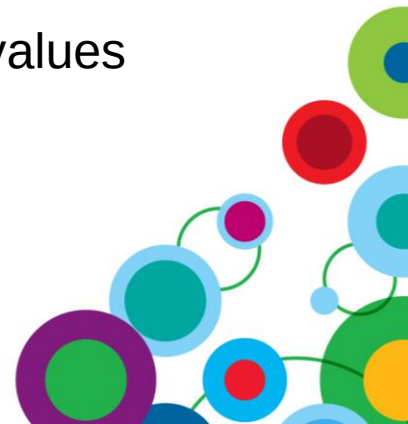




OLAP over Relational Consistent OLAP Experience

Dynamic Query Mode introduces OLAP over Relational to provide users with a true OLAP experience over relational data

- Dimensionally Modeled Relational (DMR) packages are now true OLAP data sources with Dynamic Query
- Improved ad-hoc analysis capabilities through
 - Similar behavior for crosstab and list style reports
 - Default member sorting
 - Improved suppression
 - Aggregate limitations removed
 - Nulls as zeros in arithmetic operations
 - FIRST / LAST aggregate rules respect presence of NULL values

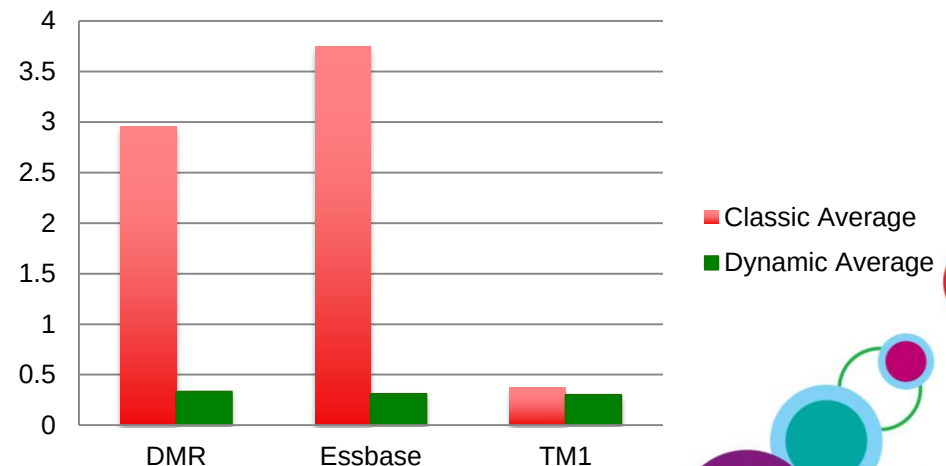


Improved Suppression

Applies to all OLAP sources

- More efficient suppression of NULL and zero
- Processed at the data source as opposed to by local process
- Applies to Analysis Studio as well
 - Analysis studio does not suppress nulls by default
 - Applies 'Visual Suppression' on NULL and zeros in returned data
 - With Dynamic Query the suppression button pushes suppression to the OLAP provider
- Some warm cache results from our labs...

Suppression Performance

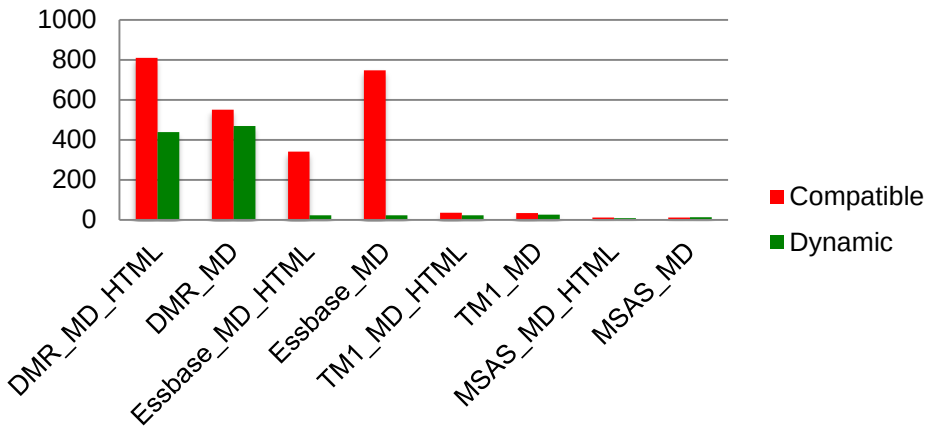




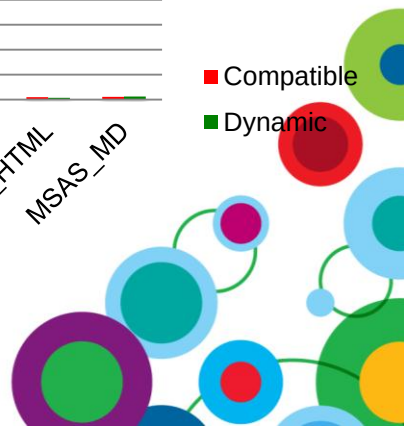
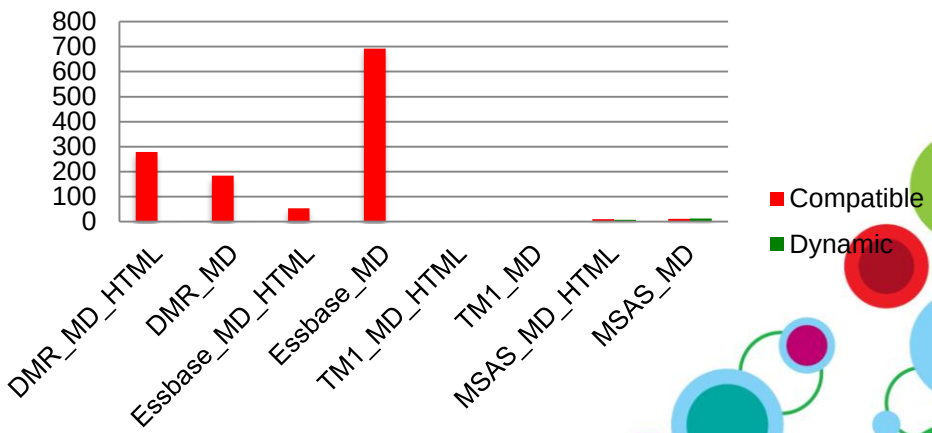
Master Detail Reporting

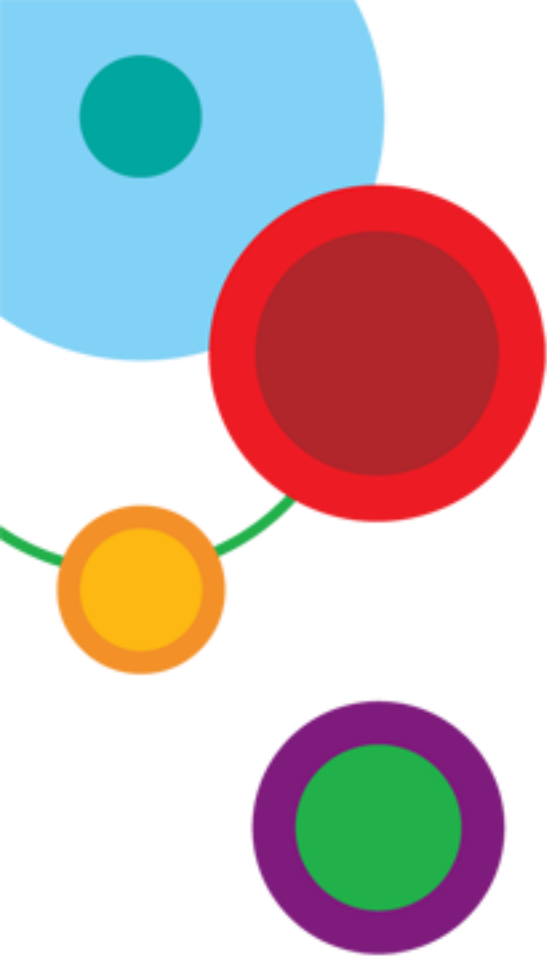
- Performance testing in our labs...
 - Substantial performance gains across the board for Essbase
 - DMR warm cache performance significantly improved
- Calculations using detail results may yield even greater improvements due to in-memory processing

Master Detail -- Cold Cache

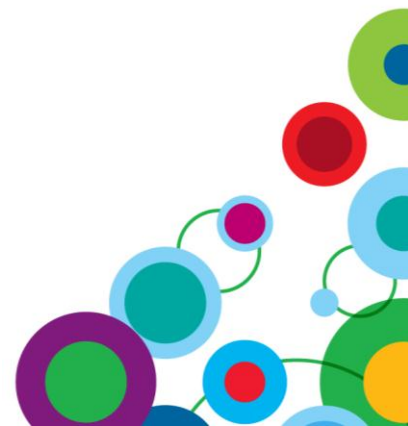


Master Detail -- Warm Cache





When should I use Dynamic Query?





TM1 - SAP BW – Essbase – OLAP Over relational

TM1

- Tighter BI and TM1 integration through DQM
- Overall fastest data source tested in our labs
 - 15% faster than Essbase
- Ensure using TM1 v9.5.2 or higher

Essbase

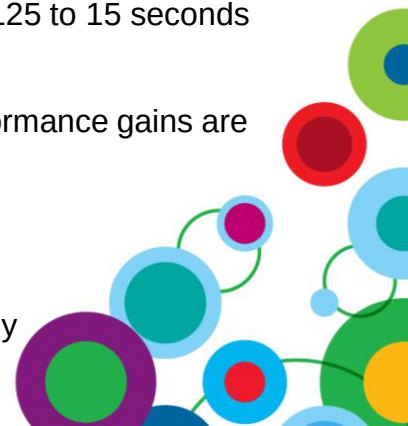
- DQ now utilizes MDX interface to access Essbase
- Performance gains recorded in our labs:
 - Cold Cache
 - 65% Improvement
 - Average query time reduced from 56 seconds to 19 seconds
 - Warm Cache
 - 95% improvement
 - Average query time improved from 45 seconds to 2 seconds!

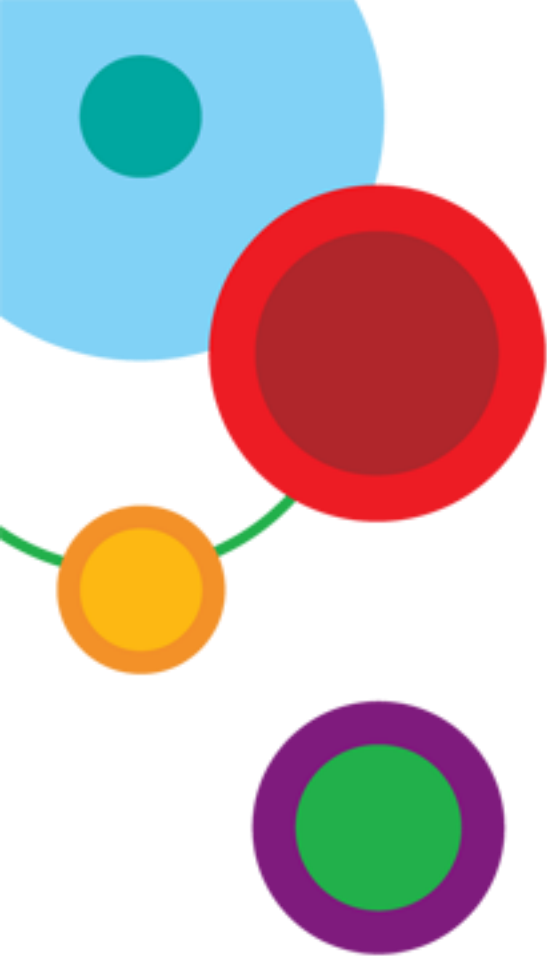
SAP BW

- Significant performance improvements due to improved query generation and smarter in-memory processing
- Prompt page performance
 - Ability to cache
- Master-Detail performance improvements
 - Improved MDX generation
 - Caching of dimensional data

OOR

- Dynamic Query cache and in-memory local, balanced processing greatly improve Dimensionally Modeled Relational (DMR) performance
- Performance gains recorded in our labs for warm cache
 - 85% performance improvement
 - Average query time from 125 to 15 seconds
- Warming of cache to ensure performance gains are immediately realized
 - Run common reports
 - Write specific reports to warm cache with frequently requested data





Where and How to use Dynamic Query?



Before You Begin...



- Dynamic Query is a new capability within Cognos 10
 - Recommended for new application development
- Existing applications require migration from Compatible to Dynamic Query Modes
- Strongly recommend the use of Lifecycle Manager to determine effort required to migrate existing applications
 - Can be performed without permanently altering package
 - Both visual and performance differences can quickly be obtained
- Not all existing applications will benefit from migrating to Dynamic Query
 - ensure benefits will be worth the effort before beginning.
- Ensure DQM conformance meets your needs
 - Packages containing multiple data sources must all be supported by Dynamic Query





Getting Started with Dynamic Query Installation and Configuration

How to install and configure Dynamic Query?

- The Dynamic Query Queryservice is enabled by default
 - Disable in Configuration if not using Dynamic Query

Query service enabled?	True
Report data service enabled?	True
Report service enabled?	True

Specifies whether the query service is enabled.

Use this property to enable or disable the query service on the local computer. By default the query service is enabled.

- The Queryservice runs in a separate JVM.
 - Enables optimal use of available memory for cache and in-memory processing
 - Ensure you have sufficient available resources before enabling to avoid having services competing for resources



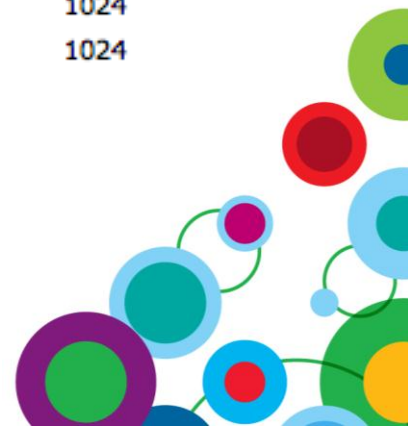


Manage the Query Service process

- Initial and maximum JVM heap size for the query service can be controlled through Administration Portal
- Recommend setting Initial and Maximum to the same value
- Controls the available memory for cache processes but not the actual cache size

Settings - QueryService

+	Name	Value
+	Logging	
-	Tuning	
	Idle connection timeout (seconds)	300
	Write model to file?	☐
	Additional JVM arguments for the query service	
	Initial JVM heap size for the query service (MB)	1024
	JVM heap size limit for the query service (MB)	1024





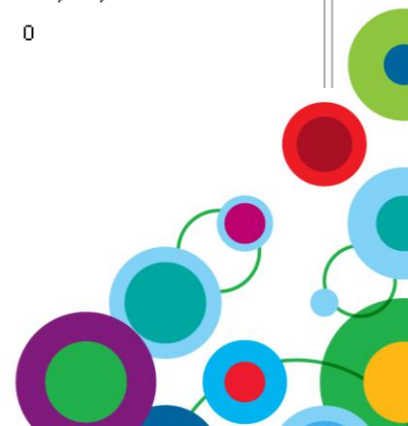
Monitor the Query Service process

- The Administration portal provides monitoring capabilities for the Dynamic Query service
- View metrics on the following:
 - number of successful, failed and processed requests
 - response times for low and high watermarks
 - successful requests per minute

Metrics - QueryService

☒ ☐ 0 ☒ ☐ 0 ☒ ☐ 0 ☒ No metric score

Name	Value
Request	
Current time	-- September 1, 2011 3:14:50 PM
Last response time	00:00:00.016
Number of failed requests	0
Number of processed requests	162,174,116
Number of successful requests	162,174,121
Percentage of failed requests	0%
Percentage of successful requests	100%
Response time high watermark	9 01:03:27.438
Response time low watermark	00:00:00.016
Seconds per successful request	1 21:49:15.980
Service time	309,624,963 19:33:56.516
Service time failed requests	00:00:00.000
Service time successful requests	309,624,963 19:33:56.516
Successful requests per minute	0



Clearing or Resetting the Cache

- Memory caches can be cleared to prevent using outdated data
- Clearing the cache can be scheduled and configured as required
- Can clear selected data sources or package (wildcard * allowed)
- Available under the New Query Service Administration option (Configuration > Content Administration)
- Can clear cache or write cache state (to view current state of the caches)



Operation:

Clear cache
Clear cache
Write cache state



Data Source Preparation – Cognos Connection

- Relational data sources - copy the vendor's JDBC drivers
- OLAP sources, install vendor's full / thick client
- Start the Cognos services
- Create new data source or edit existing to add a JDBC connection

General **Connection** **Permissions**

Specify the parameters for the connection.

Type:
IBM DB2 [Test](#)

Isolation level:
☒ Use the default object gateway
☐ Specify a value:
Cursor stability

Connection string:
^User ID:^?Password:;LOCAL;D2;DSN=GS_DB;UID=%s;PV

CLI **JDBC**

Edit the parameters to build a DB2 (driver: com.ibm.db2.jcc.DB2Driver) connection string.

☒ Enable JDBC connection

Server name:
localhost

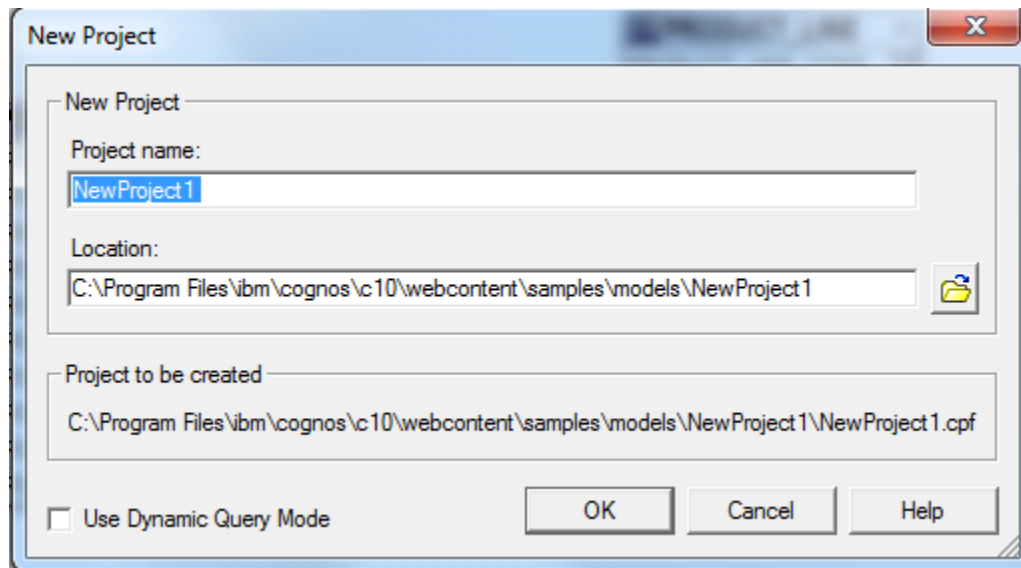
Port number:
50000

Database name:
GS_DB



Creating a DQM Enabled FM Project

- When creating a new project in FM, you now have the option of using DQM.
 - This will default all testing and publishing to use DQM
- Recommended for new FM projects using only supported DQM data sources
- You may not include unsupported data sources in a DQM FM Project
 - If you have mixed sources, use Compatible Query Mode

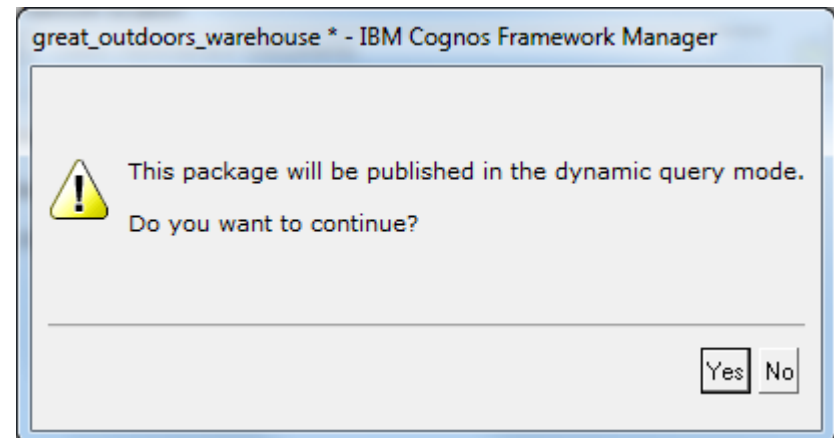
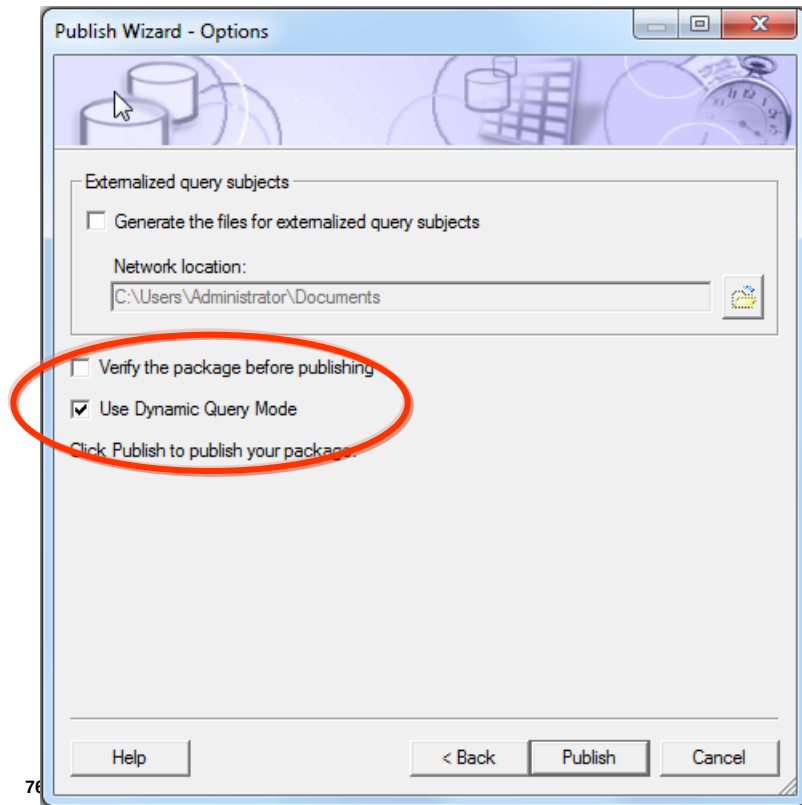


The 'New Project' dialog box is shown. It has a title bar 'New Project' with a close button. Inside, there's a 'New Project' section with a 'Project name:' label and a text box containing 'NewProject1'. Below that is a 'Location:' label and a text box containing 'C:\Program Files\ibm\cognos\c10\webcontent\samples\models\NewProject1', followed by a folder icon button. At the bottom of this section is a 'Project to be created' label and a text box containing 'C:\Program Files\ibm\cognos\c10\webcontent\samples\models\NewProject1\NewProject1.cpf'. At the very bottom, there is a checkbox labeled 'Use Dynamic Query Mode' which is currently unchecked, and three buttons: 'OK', 'Cancel', and 'Help'.

Properties	
Properties	Language
Name	NewProject2
Languages	<Click to edit.>
Design Language	en
Use Design Locale for Reference	false
Query Mode	Dynamic

Publishing Packages in Dynamic Query Mode

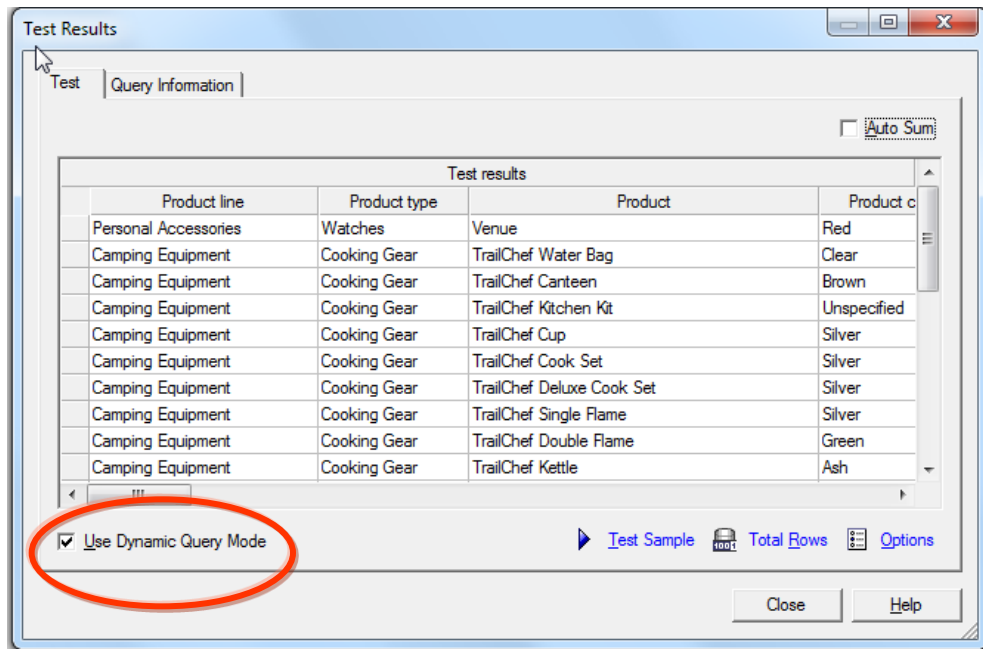
- New or existing packages may be published using Dynamic Query Mode.
- Can only publish in DQM if all data sources referenced in Package support DQM
- After publishing, all reports assigned to that package will run in DQM.



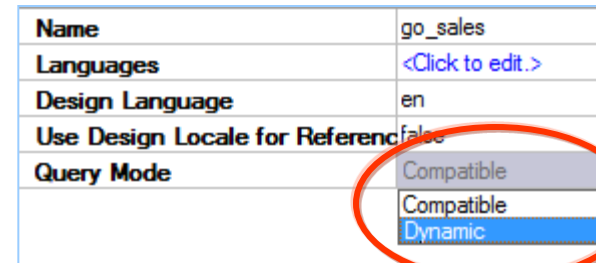


Migrating from Compatible to Dynamic Query

- In existing projects, you can specify to use DQM when...
 - Testing a query subject(s) or query item(s)
 - Publishing a Package
- Compatible is the default but you can test / publish with DQM enabled



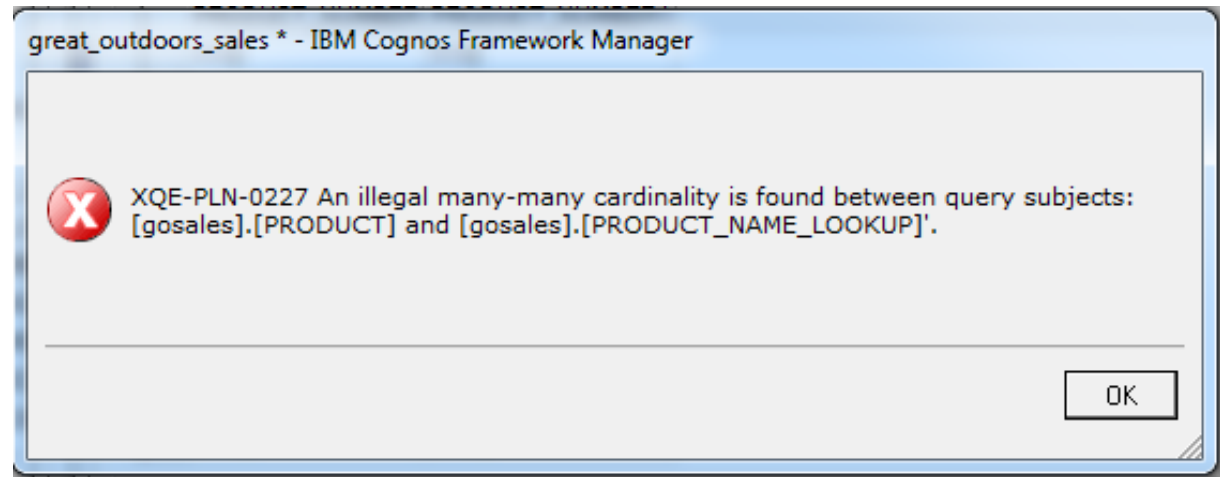
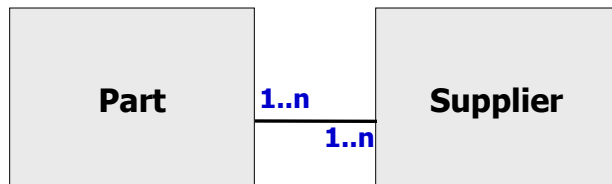
- Change the overall project property to use DQM
- Use when you are confident that project no longer required in CQM





Migration to Dynamic Query – Proven Practices

- DQM will enforce some proven practices – e.g. many-to-many joins
- To publish using DQM, you must resolve these relationships





Framework Manager Governors and DQM

- Four new governors used for configuring cache security sensitive settings
- All prefixed with (DQM)
- Can help determine how much information from the cache is shared between users

Controls how calculations with divisions are adjusted to get the desired result

(DQM) Adjust SQL generation for Exact Numeric Division

(DQM) Cache is sensitive to Connection Command Blocks:

(DQM) Cache is sensitive to DB info:

(DQM) Cache is sensitive to Model Security:

Controls the security that is used to access the cache

You can use connection command blocks to control access to data in the underlying database or for tracking

Specifies what database information is used to key the cache:

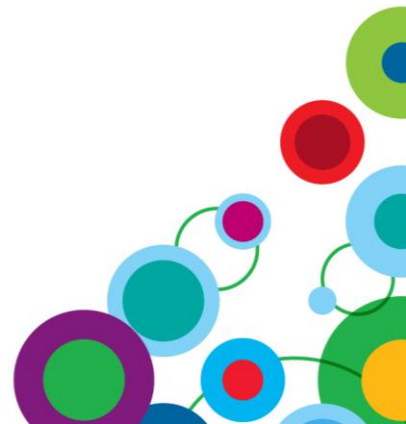
- **DB + Connection + Signon**
- DB + Connection
- DB
- None

Cast to Double	▼
☒	
DB + Connection + Signon	▼
Automatic	▼



Bypassing the DQM Data Cache

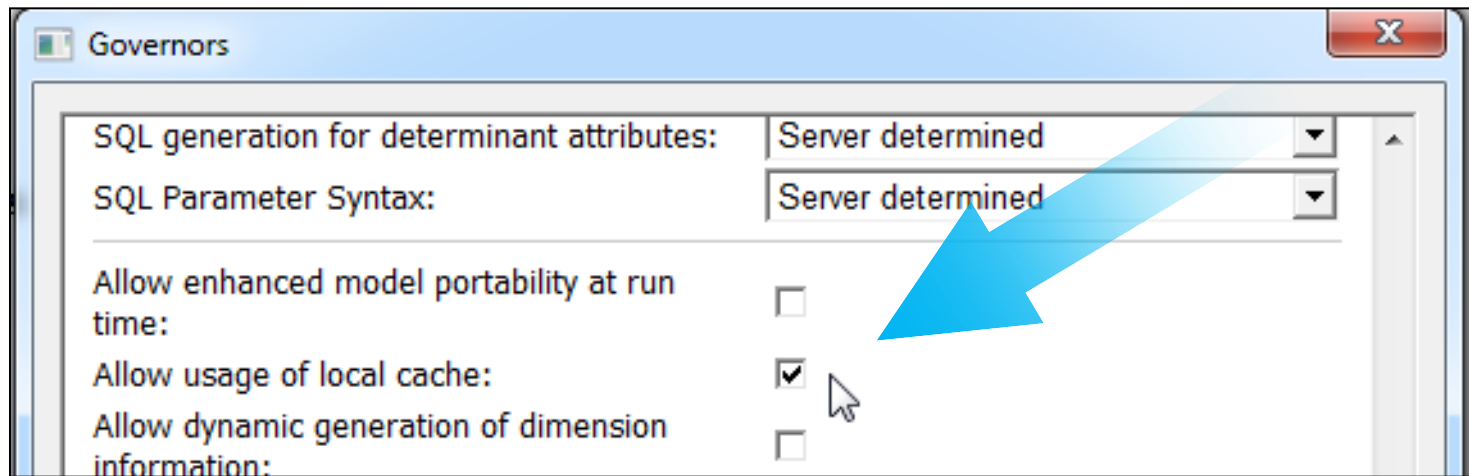
- Some reports must be current. They cannot show outdated / cached data
- Often, the data does not need to be up-to-the-minute; it simply must be relatively fresh
- If data must always be live, one option is to leave the package as CQM
- There are 2 ways to bypass cached data while using DQM
 - Turn off the Local Cache in Framework Manager before publishing the DQM package
 - Turn off Local Cache in individual report Queries





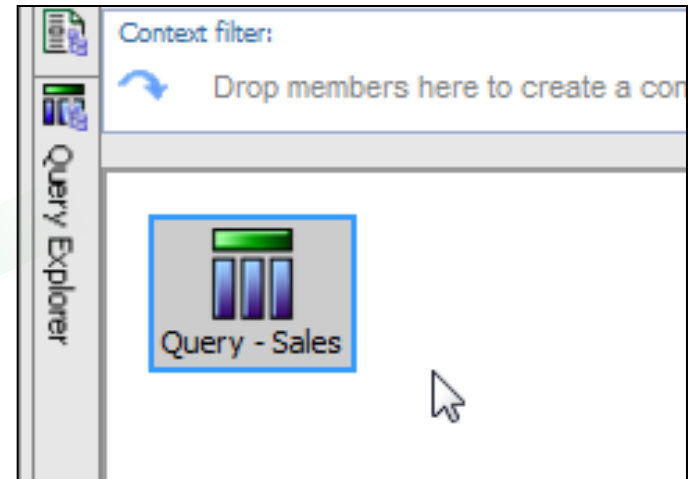
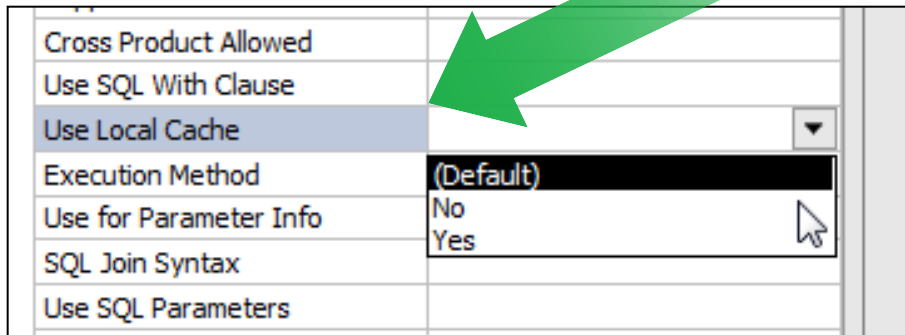
Bypassing the DQM Data Cache in FM

- To publish a package in DQM that does not use the cache
 - Disable the governor “Allow usage of local cache”
 - Publish the DQM package
 - If you wish other DQM packages to use caching – re-enable the governor
- Disabling the local cache affects all DQM queries generated through the published package



Bypassing the DQM Data Cache in an RS Query

- Another option available to Report Studio authors is to disable Use Local Cache on individual report queries.
- This is a property of the Query, not the report



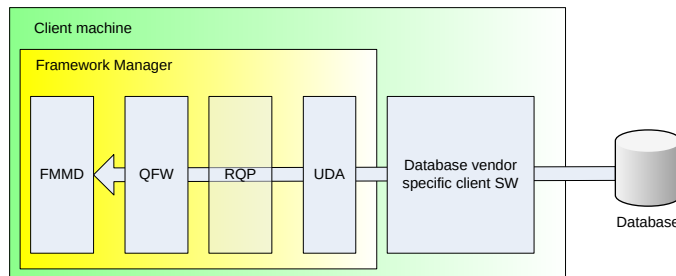


Framework Manager - Working in Dynamic Query Mode

- Architecture for import has been completely changed
 - Traditionally required client side access to data source

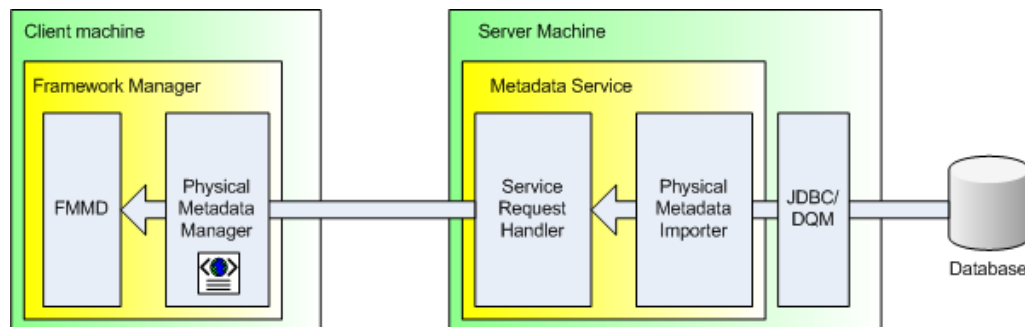
IBM Cognos Report Net and Cognos 8.x, 10.1 Architecture for

import



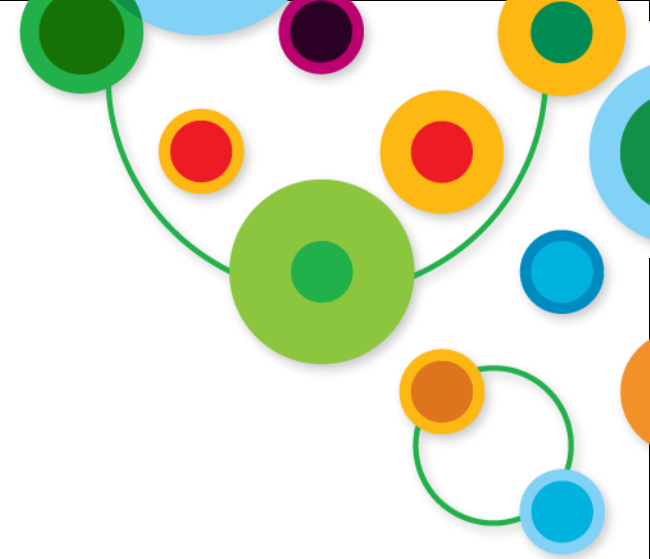
- New metadata import mechanism available for DQM
 - JDBC import that leverages RELMD in Metadata Service in BI Server

IBM Cognos 10.1.1 Architecture for import for DQM



IBM Cognos 10.1.1 Infrastructure

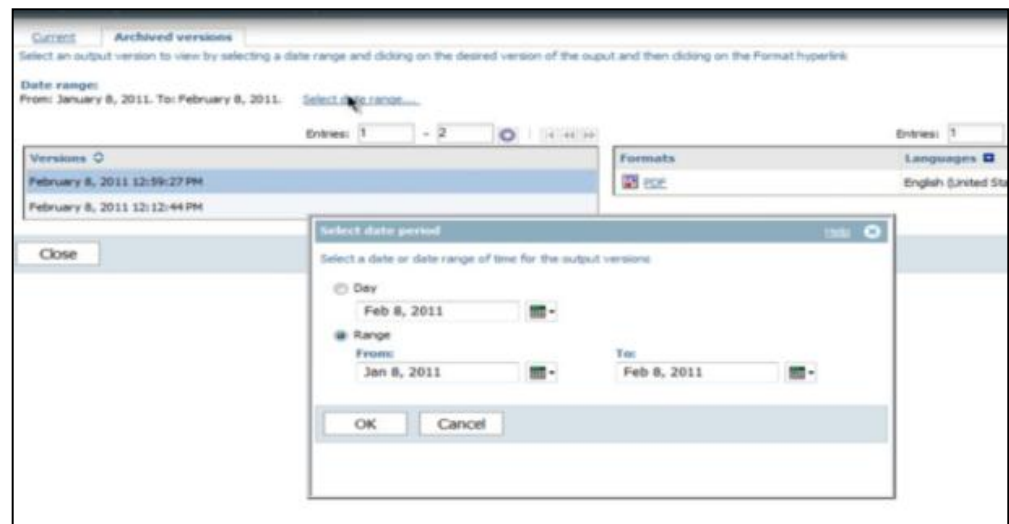
Content Archival





Content Archival – ECM / FileNet Integration

- Archive and retrieve report output with FileNet 5 and Cognos 10



Users easily access archived reports stored in FileNet through Cognos 10 – the same as accessing current reports

Business Value

Ease of use for long term storage of historical & critical reports while reducing the size of the Cognos Content Store



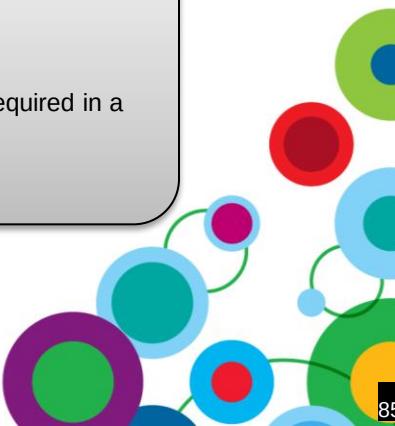
Solution

Administrators can store reports in ECM/FileNet for long term storage and users can access the same reports – all through the Cognos UI



Business Problem

Long term persistence of important reports required in a content archival system



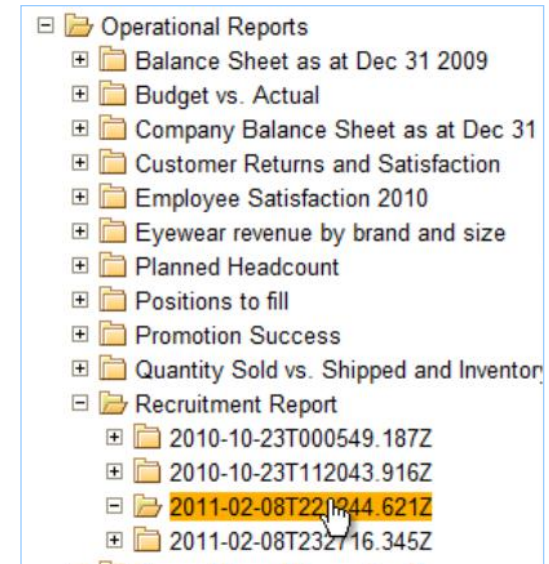


Administration of document archival made easy

- Administrators can quickly and easily move reports to be archived
- Administrators can manage retention settings on reports & packages
- Leaner Cognos content store with more files stored in FileNet Content Manager
- Can setup to not have the report spec (xml) be saved to the directory



Cognos Connection Report folder structure replicated in FileNet (for applications chosen)





Cognos BI organized in FileNet Content Manager

Name: 2010-10-21T154721.336Z
Class: REPORT VERSION

Properties

Folder Name: 2010-10-21T154721.336Z

REPORT VERSION DEFAULT NAME: 2010-10-21T15:47:21.336Z

REPORT STORE ID: 136D75B20989D43DF9CCFE93EEC5590EF

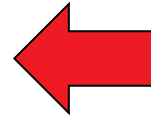
REPORT AS OF TIME: 10/21/10

REPORT VERSION CREATION TIME: 10/21/10

REPORT EXECUTION SPECIFICATION: Choose...

REPORT VERSION OWNER: CAMID ("::Anonymous")

Within FileNet, some Cognos metadata from the Cognos Content Store is exposed (CAMID, Content Store ID, Execution Parameters, etc)



Content administration tasks related to Archival

Configuration Index Search

Administration

Entries: 1

Name	Modified
Corporate_business_insight_samples	August 16, 2011

Consistency Check...
Report Upgrade...
Content Removal...
Retention Rule Update...
Content Archival...

Delete saved output versions

Mass-manage retention rules

Force archive saved output versions



Improved end user efficiency



View report output versions - Total Revenue by Country

Help

Current Archived versions

Select an output version to view by selecting a date range and clicking on the desired version of the output and then clicking on the Format hyperlink

Date range:
From: July 16, 2011. To: August 16, 2011. [Select date range...](#)

Entries: 1 - 8

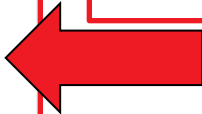
Formats Languages

HTML

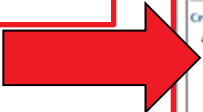
English

Close

Users view archived versions stored in FileNet the same way as they view current versions through Cognos BI



Search on archived documents stored in FileNet from Cognos BI



Search

Sam Carter Log Off

customer service

Search Advanced

Entries: 1 - 19 of about 19

Refine by:
Type
< Any Type
Archived Output
Creation Date
Any Date
2011 (18)
2010 (1)

Name

Employee Satisfaction 2010 (Archived Excel 2007)

Employee Satisfaction 2010 (Archived PDF)

Recruitment Report (Archived Excel 2007)

Recruitment Report (Archived Excel 2007)

Recruitment Report (Archived Excel 2007)

Recruitment Report (Archived PDF)

Recruitment Report (Archived PDF)

Recruitment Report (Archived PDF)

100%

88%

86%

86%

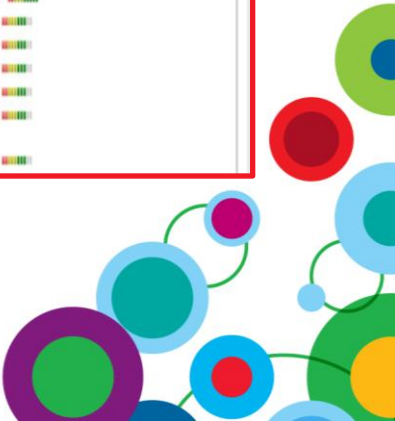
86%

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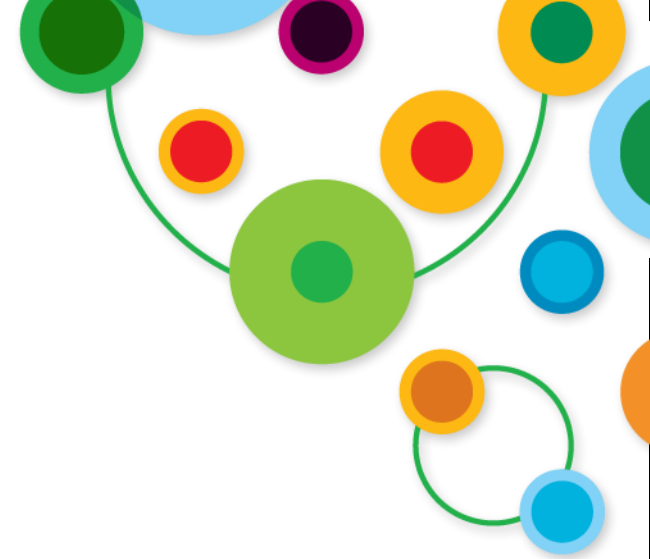
86%

Actions



IBM Cognos 10.1.1 Infrastructure

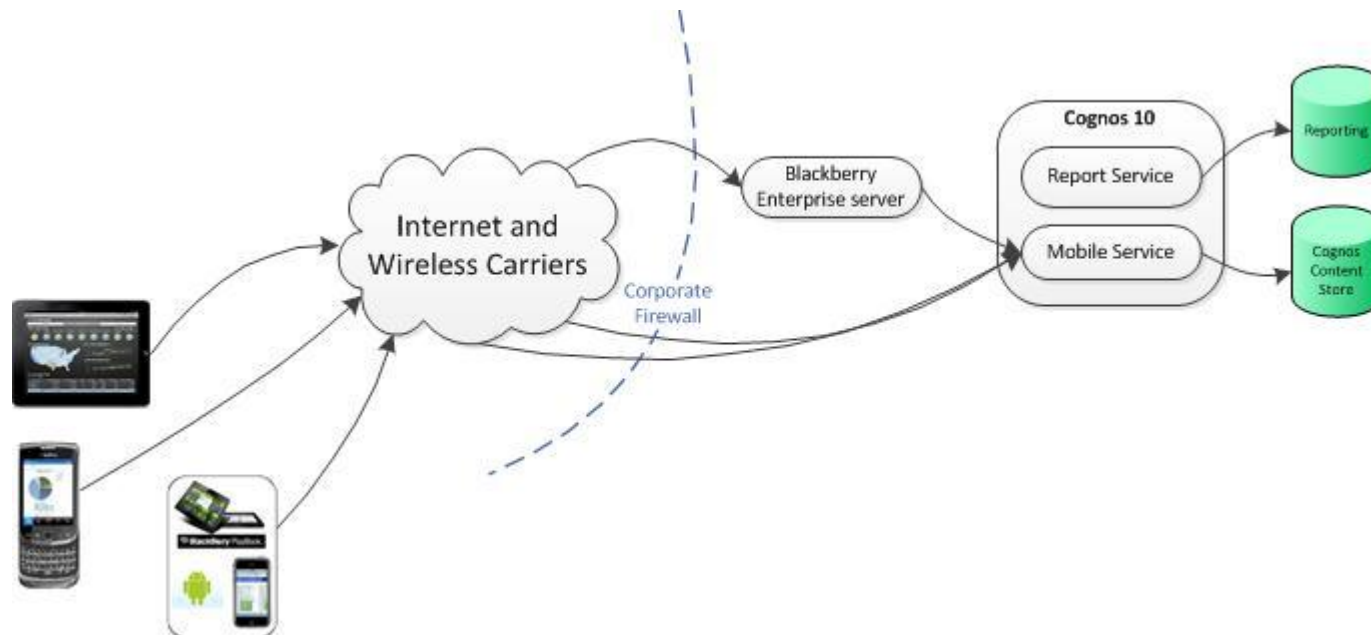
IBM Cognos Mobile 10.1.1



IBM Cognos Mobile 10.1.1 Infrastructure



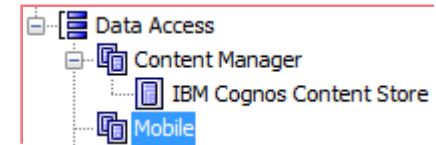
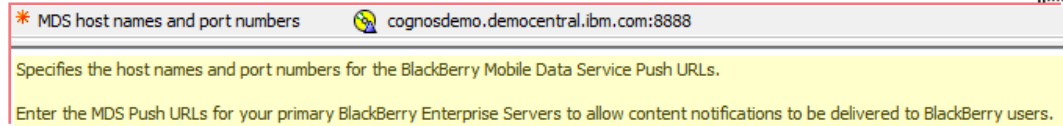
- Apple, Android and RIM devices are supported
- Mobile devices require a VPN for secure connections
- Blackberry Enterprise Server is required for Blackberry devices
- The Cognos Mobile Service receives mobile requests
- The Cognos Report Service executes reports
- Leverage security that has been established in Cognos10.1.1



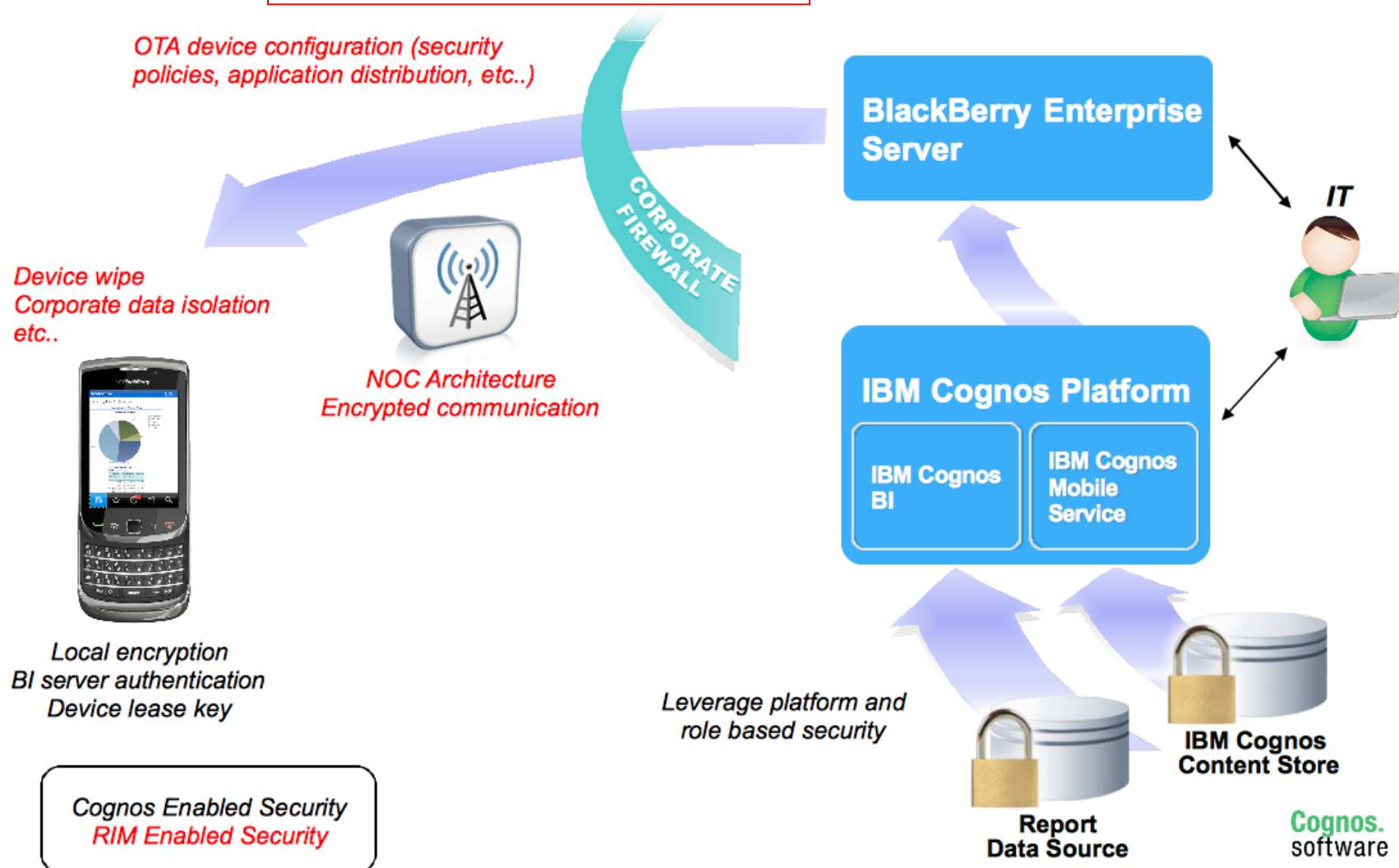


Installing IBM Cognos 10.1.1 Mobile

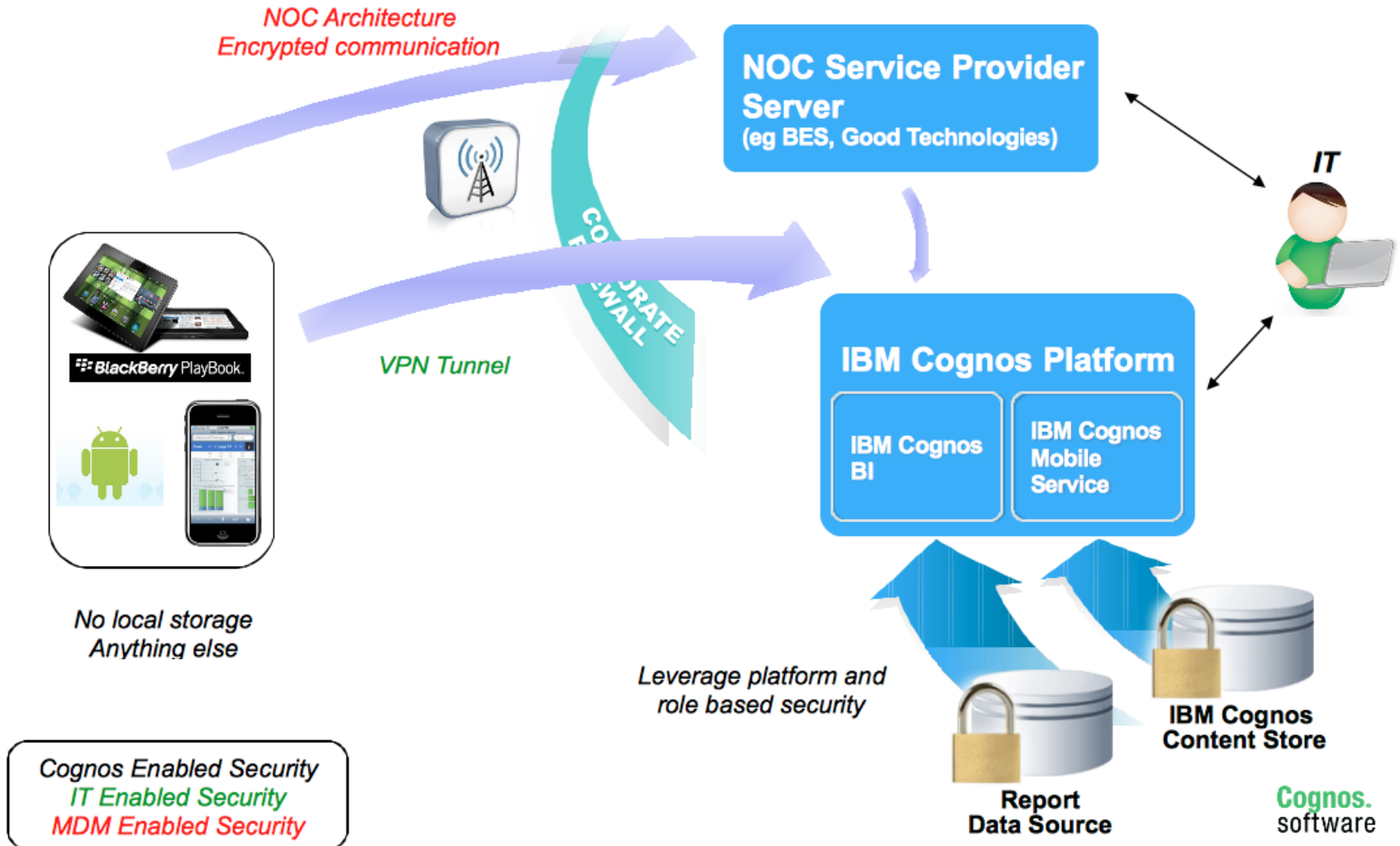
- Mobile has a separate installation package
 - It installs the Cognos Mobile Service
 - New Content Store tables
- Rich Client Installations are different depending on device
 - Apple iPad App client can be downloaded from the Apple App Store
 - OTA Push commonly used for Blackberry
 - URL Initiated OTA Install
 - Direct link to device
- What is stored on the mobile device?
 - Web Applications are based on an optimized web portal (iPad, iPhone, Playbook, Android). So nothing is stored on the device.
- What about Security?
 - Web application is based on IBM Cognos security and hence supports single sign on.
 - Web application supports enterprise based encryption protocols for communication over the internet, such as TLS.



IBM Cognos Mobile BlackBerry Support Overview & Security



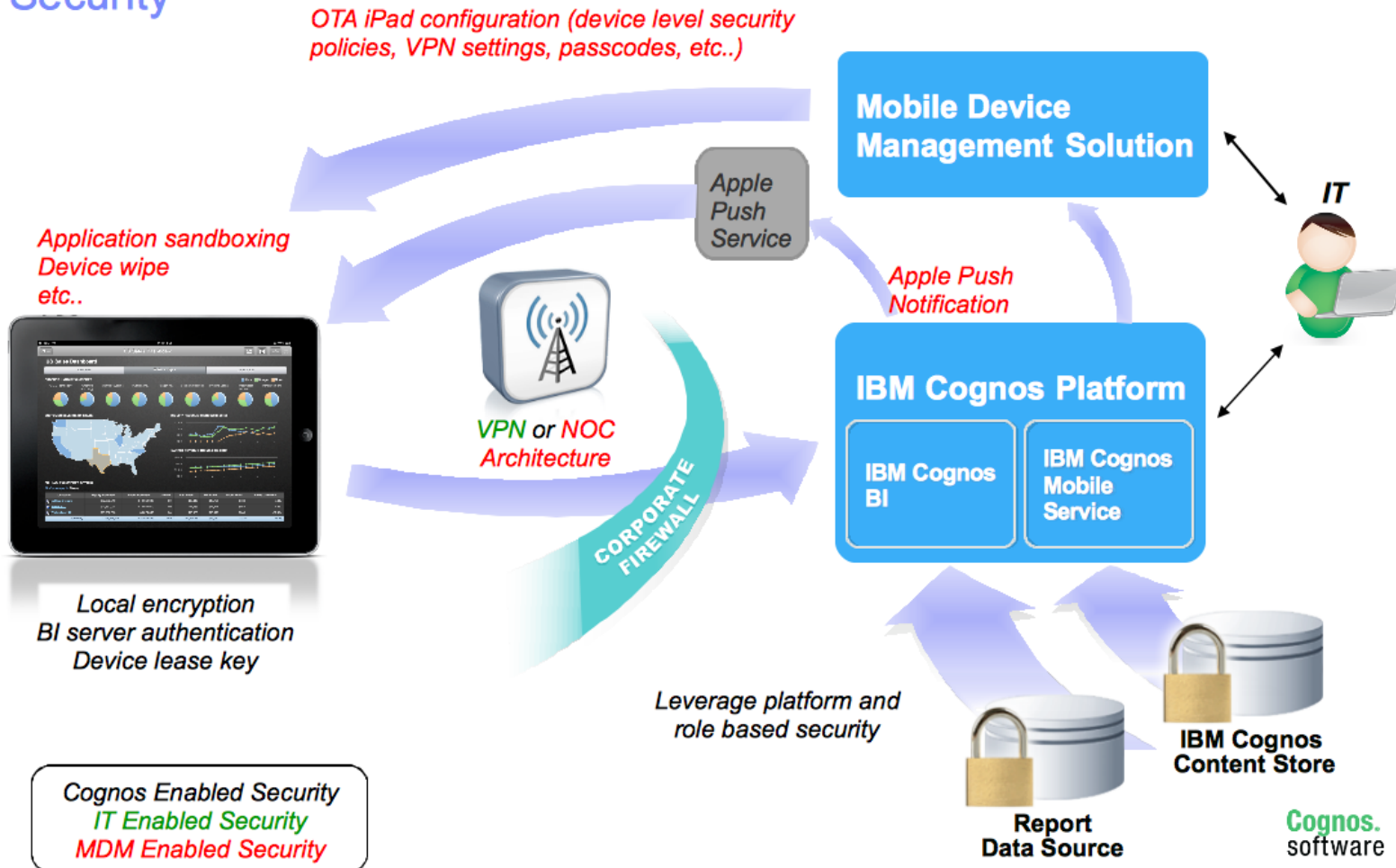
IBM Cognos Mobile Web Application Support Overview & Security





iPAD – Apple Push Service Support

IBM Cognos Mobile Native iPad Application Support Overview & Security



Performance and other considerations for iPad Native app



- Smart polling ensures that only the reports waiting for the user are retrieved from the server.
- Smart caching mechanism used to avoid downloading content more than once
 - For example: Active Report libraries (controls), standard corporate images such as logos, etc, are downloaded only once to an iPad and are then re-used
 - Cached data means that the iPad user interface is always fast and responsive, and minimize “freezes” while waiting for a slow network
- Do not use “log off”
 - “viewed” reports you selected online from a BI server will be dropped from your local native app cache.
 - Automatically downloaded on next log on as they are cached in your mobile account
 - Network traffic implication



The format for the URL link to connect your iPad to the server is **<server name>/cognos**

This is different from the URL used to connect to the IBM Cognos Mobile optimized web portal, which is **server name>/cognos/m**





Offline Mobile Reports

- iPad native app has the ability to view reports offline
- The mobile client stores the latest version of each report run by the client or sent to the client
- Local copies are secure, report access is managed by a “lease” obtained from the server

— Client can view reports for the period of time dictated by the **Lease.DurationHours**

The screenshot shows the IBM Cognos Administration web interface. The 'Configuration' tab is selected, and the 'MobileService' settings are being viewed. The 'Lease.DurationHours' parameter is set to 36.

Parameter	Value
☐ _Internal	AAAAAg==
☐ Cache.IOSStorageEncryption	AES128
☐ Cache.SymbianStorageEncryption	AES128CBC
☐ Cache.WinMoStorageEncryption	AES128
☐ CredentialCache.DurationHours	0
☐ Lease.DurationHours	36

If the client is unable to contact the server and refresh its lease within the window defined.

The client's lease 'expires' and the user no longer has access to the locally-stored contact until they are able to re-authenticate with the server and renew their lease.

- The mobile web portal only works online. Reports aren't available while offline when using the mobile web portal.





Trouble Shooting

- Cognos Mobile Service does not start
 - Check ..\c10\logs\mob.log
 - Common issues include Gateway / Dispatcher configuration referring to 'localhost'
- IIS 7.0 and above
 - For the error "*no operation specified*" error
 - Change the CGI-Cognos entry in IIS applicationhost.config or Cognos web.config to include allowPathInfo="true"
- Performance impacts
 - Volume of data, network connectivity, database performance, hardware performance
 - When designing reports consider:
 - Device Capacity (Speed and storage)
 - Radio signal strength at point of reception
 - Carrier network data transfer limitations
 - Size of report / volume of data
- java.lang.NoClassDefFoundError can occur while a report is running on UNIX operating system if the server is running in headless mode.
 - To resolve this problem, in the *c10_location/bin* directory, in the IBM Cognos Business Intelligence startup.sh file, add the following parameters:

JAVA_OPTS=-Djava.awt.headless=true



Questions



barnaby.cole@au1.ibm.com



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- Read the session abstracts
- View the line up of speakers
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