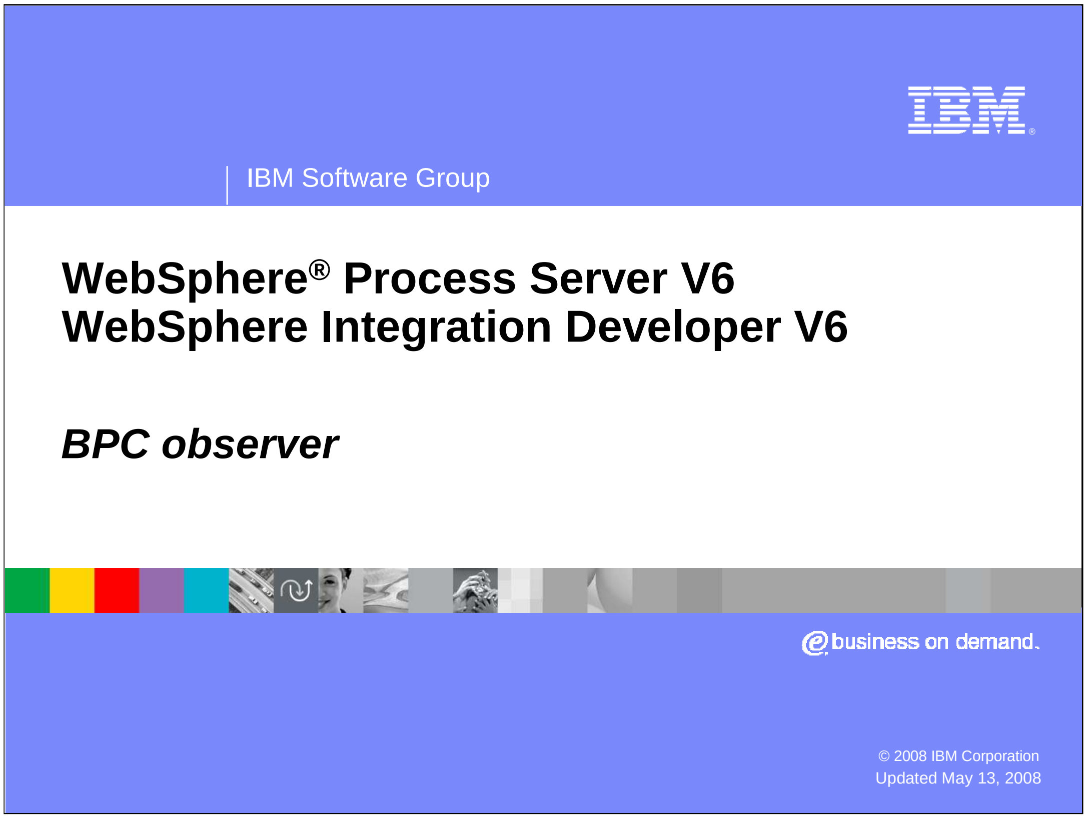

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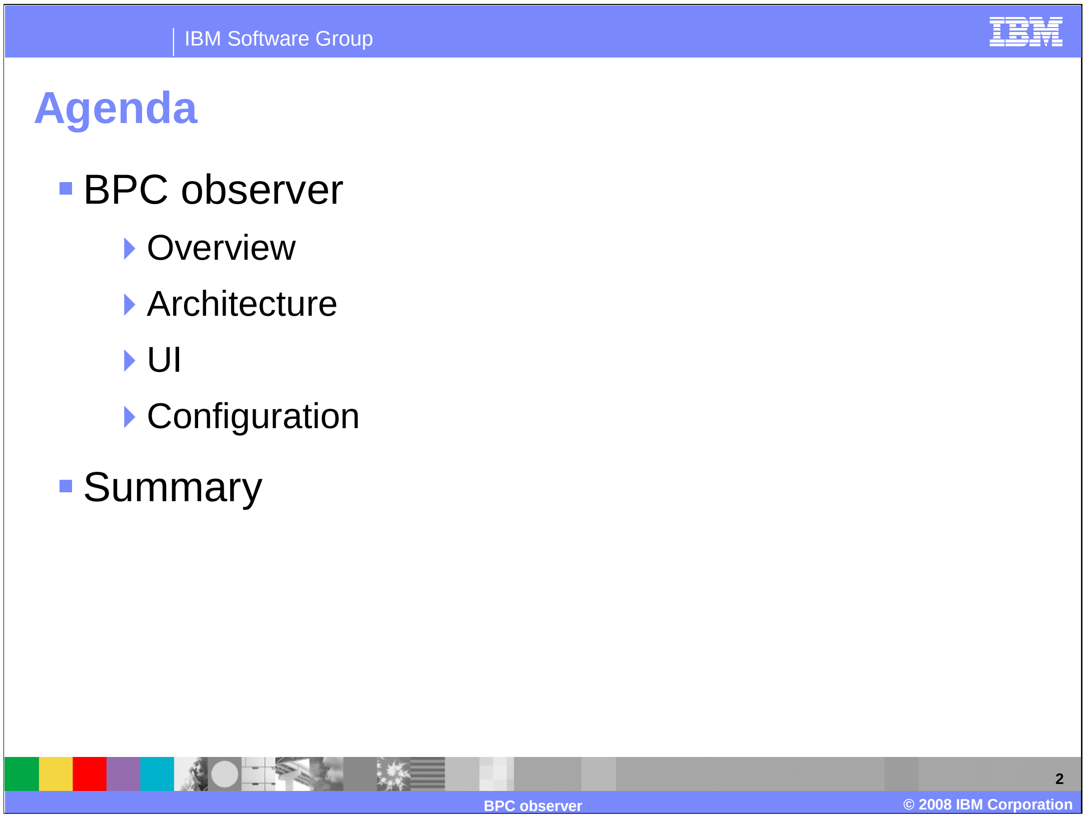
WebSphere® Process Server V6
WebSphere Integration Developer V6

BPC observer

business on demand.

Updated May 13, 2008

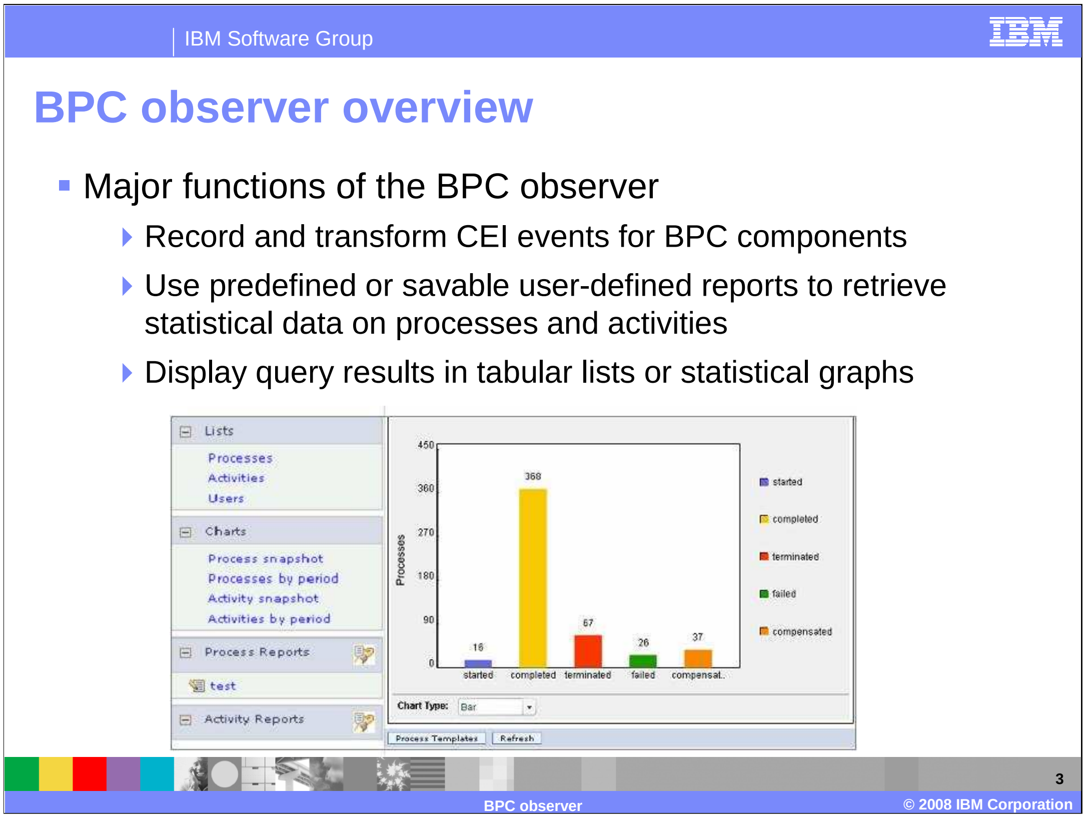
This presentation covers the BPC observer, which is provided by WebSphere Process Server.



Agenda

- BPC observer
  - Overview
  - Architecture
  - UI
  - Configuration
- Summary

This presentation starts out with an overview of what the BPC observer is, followed by a description of its architecture. Then you will learn about how the BPC observer works by looking into its user interface and configuration. The presentation concludes with a summary of what you have learned.



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BPC observer overview

- Major functions of the BPC observer
  - Record and transform CEI events for BPC components
  - Use predefined or savable user-defined reports to retrieve statistical data on processes and activities
  - Display query results in tabular lists or statistical graphs

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BPC observer

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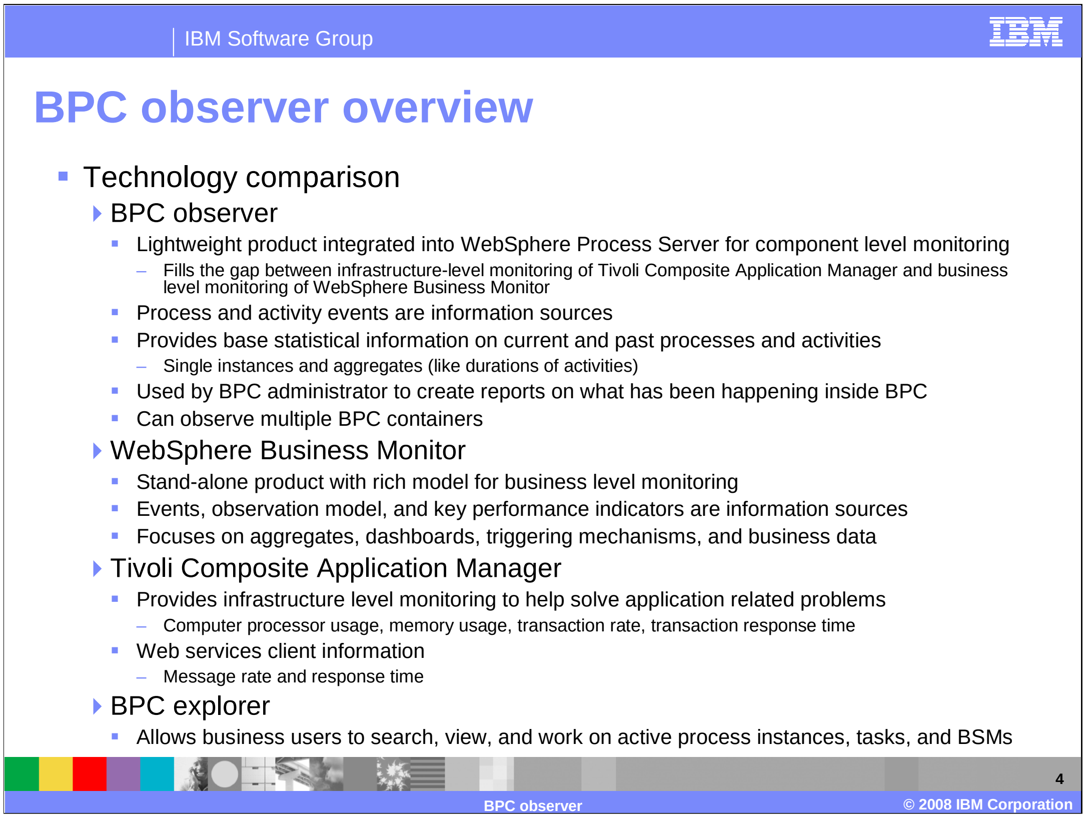
The BPC observer lets you observe state and evolution of business processes, including overall duration and actual work time. It provides customizable reports and graphical charts of historical and accumulated data of business processes and lets you retrieve statistical data on processes and activities. You can determine how many processes have been or are being run by the underlying BPEL infrastructure and the load on the process infrastructure. Furthermore, you can see the percentage of failed instances, and how long it took to run the instances. If these statistics are collected regularly, then the BPC observer also allows you to detect changes in the usage pattern of the BPEL infrastructure. Thus, increasing load can be detected and resources can be added to the processing infrastructure.

The BPC observer performs three major functions. The first function is to record and transform Common Event Infrastructure, or CEI, events for the BPC components. These events have to be enabled at development time, then at run time, the BPC observer subscribes to the events being emitted for the BPC components. The second function is to use predefined or savable user-defined reports to retrieve statistical data on processes and activities. The BPC observer comes with some predefined reporting functionality that allows you to choose a certain time period or time duration for processes and activities. If those do not suit what you are doing, then the BPC observer allows you to build your own reports. The user-defined reports are saved so that the next time you use the BPC observer, your custom report is available. The third function is to display query results in tabular lists or statistical graphs. The tabular lists allow you to see the CEI information for BPC components in an organized table format. In addition to tables, you can display report information in a pie chart or bar graph. An example of the graph display is shown on this slide.



BPC observer overview

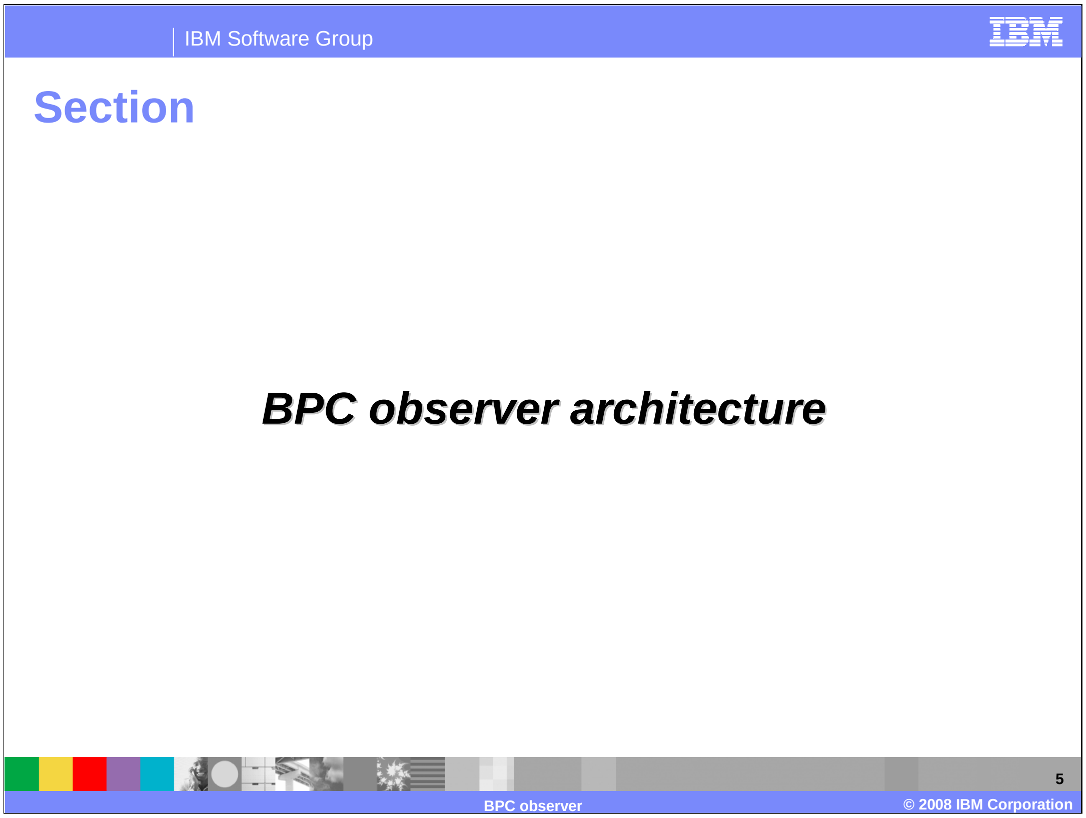
- Technology comparison
  - BPC observer
    - Lightweight product integrated into WebSphere Process Server for component level monitoring
      - Fills the gap between infrastructure-level monitoring of Tivoli Composite Application Manager and business level monitoring of WebSphere Business Monitor
    - Process and activity events are information sources
    - Provides base statistical information on current and past processes and activities
      - Single instances and aggregates (like durations of activities)
    - Used by BPC administrator to create reports on what has been happening inside BPC
    - Can observe multiple BPC containers
  - WebSphere Business Monitor
    - Stand-alone product with rich model for business level monitoring
    - Events, observation model, and key performance indicators are information sources
    - Focuses on aggregates, dashboards, triggering mechanisms, and business data
  - Tivoli Composite Application Manager
    - Provides infrastructure level monitoring to help solve application related problems
      - Computer processor usage, memory usage, transaction rate, transaction response time
    - Web services client information
      - Message rate and response time
  - BPC explorer
    - Allows business users to search, view, and work on active process instances, tasks, and BSMs

This slide compares the BPC observer, WebSphere Business Monitor, Tivoli Composite Application Manager, and BPC explorer. The BPC observer is a lightweight product integrated into WebSphere Process Server for component level monitoring. It fills the gap between infrastructure-level monitoring of the Tivoli Composite Application Manager and the business-level monitoring of WebSphere Business Monitor. The process and activity events are the only information source. It provides base statistical information on current and past processes, activities and human tasks by resolving statistics from single instances and aggregates like durations of activities. It is used by a BPC administrator to create reports on what has been happening inside BPC.

WebSphere Business Monitor is a stand-alone product with a rich model for business-level monitoring. Events, observation model, and key performance indicators are information sources. It focuses on aggregates, dashboards, triggering mechanisms, and business data.

Tivoli Composite Application Manager provides infrastructure level monitoring to help solve application related problems like computer processor usage, memory usage, transaction rate, and transaction response time. It also helps monitor Web services client information like message rate and response time.

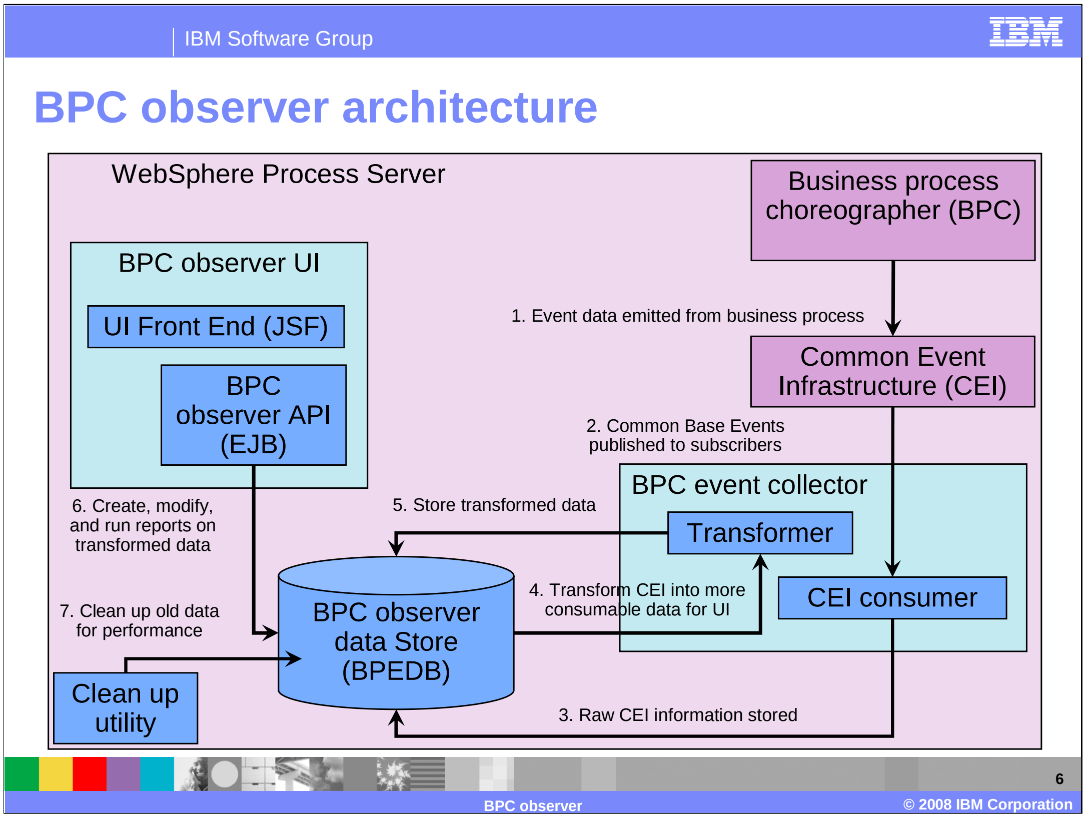
BPC explorer lets you search and work on active process instances, tasks, and business state machines. It has no reporting features, but it is the BPC client that operates on BPC components.



Section

BPC observer architecture

This section describes the architecture of the BPC observer.



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BPC observer architecture

WebSphere Process Server

Business process choreographer (BPC)

1. Event data emitted from business process

Common Event Infrastructure (CEI)

2. Common Base Events published to subscribers

BPC event collector

Transformer

CEI consumer

3. Raw CEI information stored

4. Transform CEI into more consumable data for UI

5. Store transformed data

BPC observer UI

UI Front End (JSF)

BPC observer API (EJB)

6. Create, modify, and run reports on transformed data

7. Clean up old data for performance

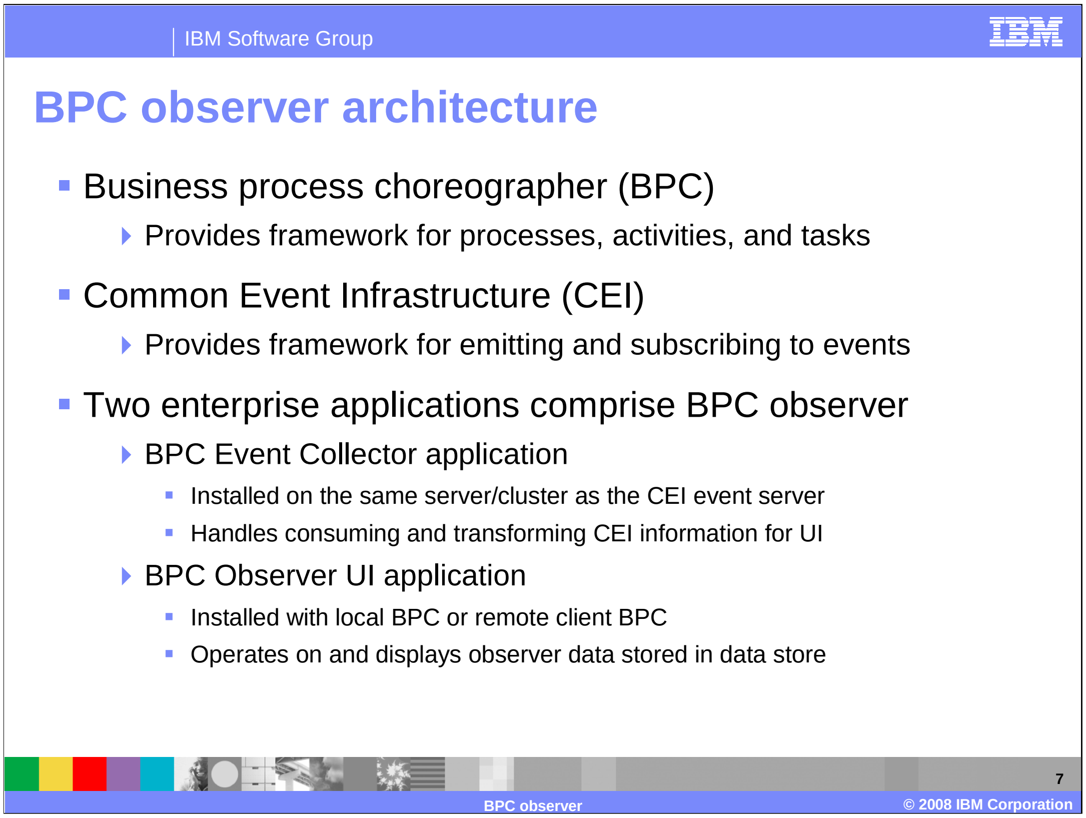
Clean up utility

BPC observer data Store (BPEDB)

6

BPC observer

The BPC observer is delivered in two parts, the BPC observer UI and the BPC Event Collector. Both are contained in their own standard Java™ EE enterprise archive, or .ear file. Configuration scripts are provided for deploying the applications and these scripts can be called stand-alone or as part of the overall BPC configuration. The business flow manager and the human task manager components emit information on changes occurring on processes and human tasks using the Common Event Infrastructure. The BPC observer subscribes to specified groups of events offered by CEI to be notified about events coming from the business process choreographer. Upon notification, the event data is moved from CEI into the BPC observer data store for further processing. By moving the data from CEI into its own data store, the BPC observer does not influence the overall performance of CEI beyond being a subscriber to it. The data capture phase is completed by transforming the data already in the data store into a format more suitable for the queries of the BPC observer UI. Once the transformed data is in the BPC observer data store, it is available for querying from the BPC observer UI. The BPC observer EJB APIs use the transformed data to create, modify, and run reports on the transformed data. The user interface of BPC observer is built using standard Java Server Faces, or JSF, and using the BPC JSF components. The look is similar to the BPC explorer client application.



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BPC observer architecture

- Business process choreographer (BPC)
  - Provides framework for processes, activities, and tasks
- Common Event Infrastructure (CEI)
  - Provides framework for emitting and subscribing to events
- Two enterprise applications comprise BPC observer
  - BPC Event Collector application
    - Installed on the same server/cluster as the CEI event server
    - Handles consuming and transforming CEI information for UI
  - BPC Observer UI application
    - Installed with local BPC or remote client BPC
    - Operates on and displays observer data stored in data store

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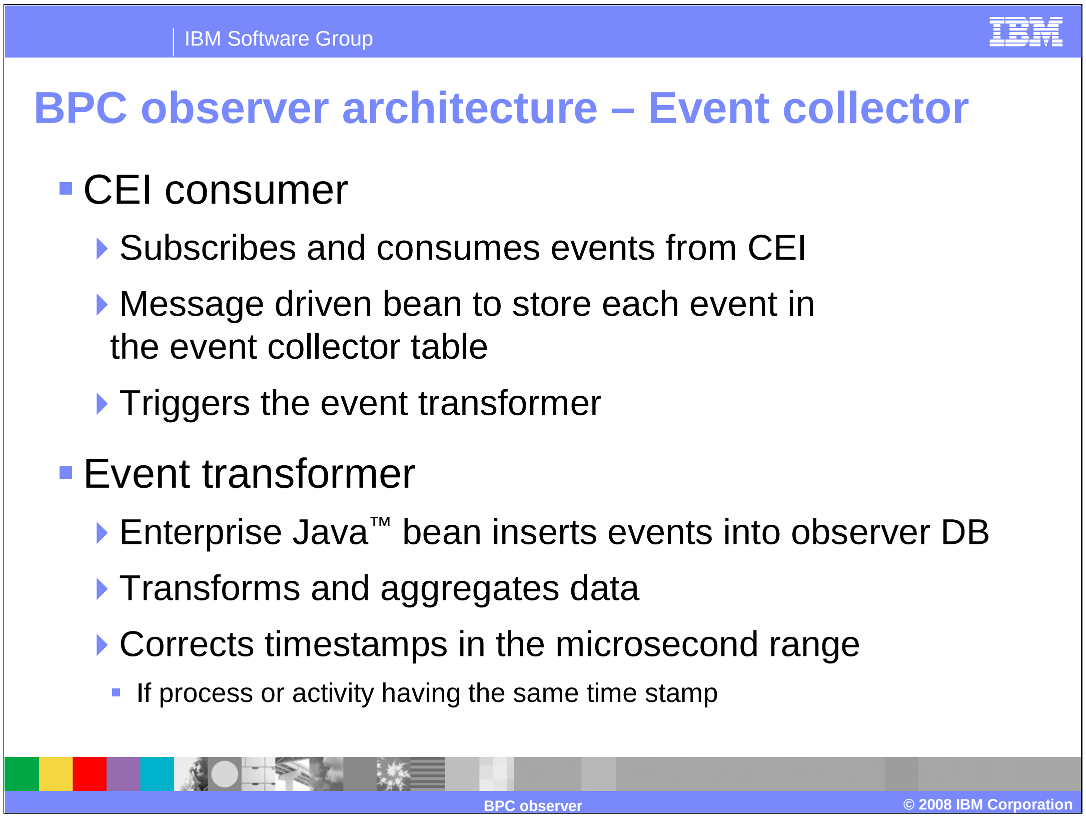
BPC observer

The basis of the BPC observer is the business process choreographer, or BPC. It provides a framework for processes, activities, and tasks. The Common Event Infrastructure provides the framework for emitting and subscribing to events for these BPC activities and processes. Two enterprise applications comprise BPC observer: the BPC Event Collector application and the BPC Observer UI application. The BPC Event Collector application is installed on the same server or cluster as the CEI event server. It handles consuming and transforming CEI information for the UI. The BPC Observer UI application is installed with local BPC or remote client BPC. It operates on and displays BPC observer data stored in the BPEDB data store.



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BPC observer architecture – Event collector

- CEI consumer
  - Subscribes and consumes events from CEI
  - Message driven bean to store each event in the event collector table
  - Triggers the event transformer
- Event transformer
  - Enterprise Java™ bean inserts events into observer DB
  - Transforms and aggregates data
  - Corrects timestamps in the microsecond range
    - If process or activity having the same time stamp

BPC observer

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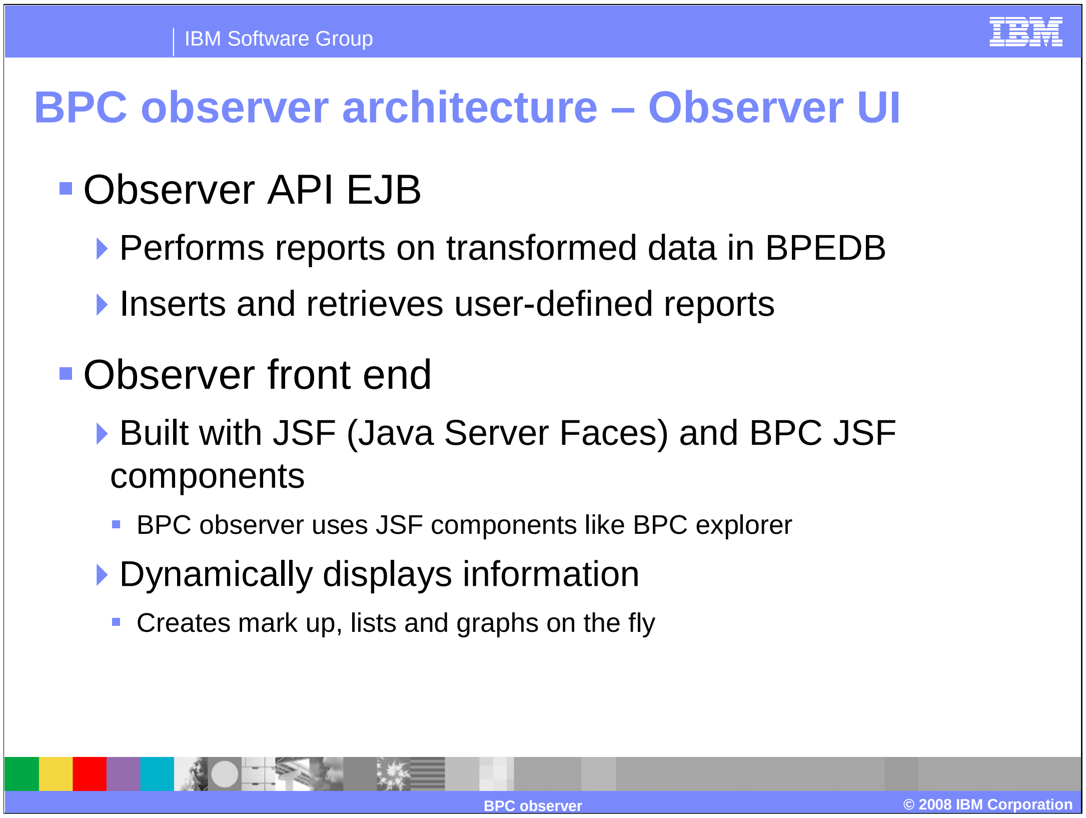
The BPC Event Collector component is responsible for recording the information about the business process choreographer components. This information is emitted as Common Base Events, which the Common Event Infrastructure processes. The information is stored in the BPC observer data store. Periodically, the raw data is transformed into a data format more suitable for the BPC observer's reports. Finally, it is made available in the data store for queries from the BPC Observer UI component.

The BPC Event Collector contains two sub components: CEI Consumer and Event Transformer. The CEI Consumer subscribes to the CEI events coming from the BPC components. The subscription is defined by a CEI Event Group. Each BPC Event Collector configuration creates such an Event Group. Each CEI event from BPC is sent to an instance of the CEI consumer, which extracts the content and puts it into the BPC observer data store. The Event Transformer reads all entries belonging to the process instances from the data store. It then aggregates the information, and performs updates on the data entries associated with the process instance in the tables accessible from the Observer UI. That way the number of update operations on entries representing process instances is reduced.

Once all events related to the process instance have been processed, they are removed from the special table. The Event Transformer then continues with the next process instance from the list that it determined in the first step. This process is continued until the list is empty. Process instance work time, number of instance events, number of activity events of a process instance and activity instance are calculated by the Event Transformer before performing an update operation.



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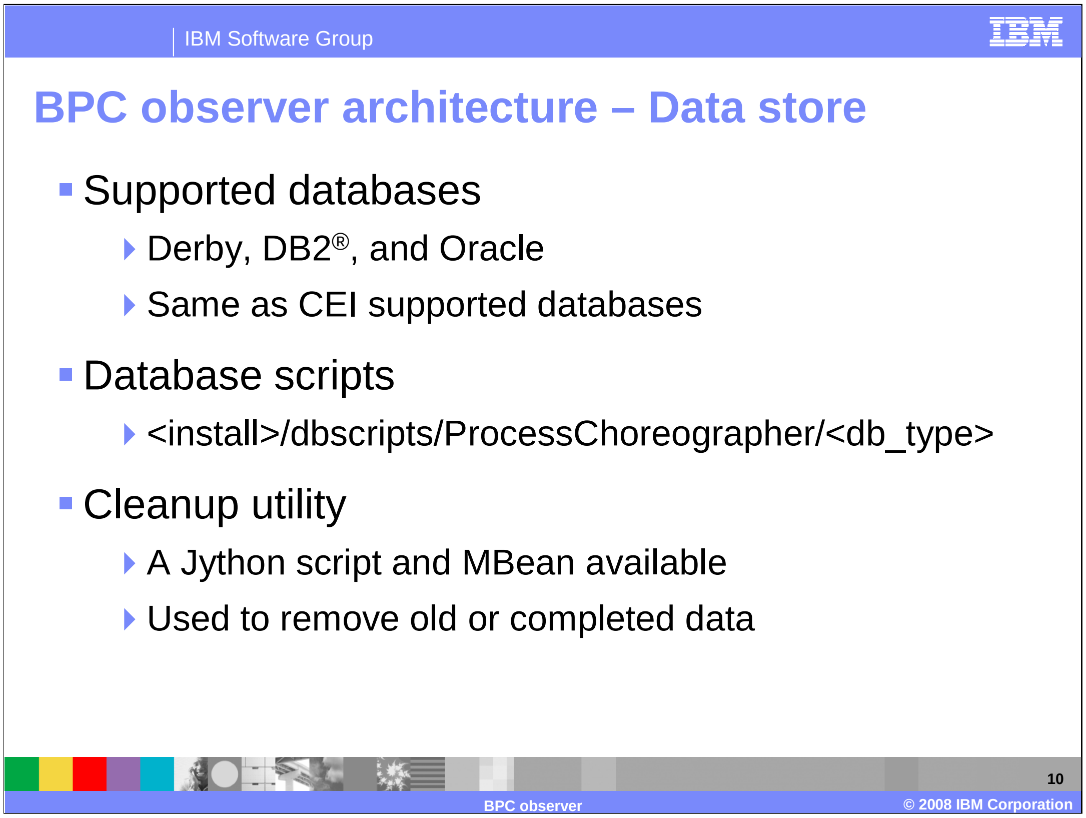
BPC observer architecture – Observer UI

- Observer API EJB
  - Performs reports on transformed data in BPEDB
  - Inserts and retrieves user-defined reports
- Observer front end
  - Built with JSF (Java Server Faces) and BPC JSF components
    - BPC observer uses JSF components like BPC explorer
  - Dynamically displays information
    - Creates mark up, lists and graphs on the fly

BPC observer

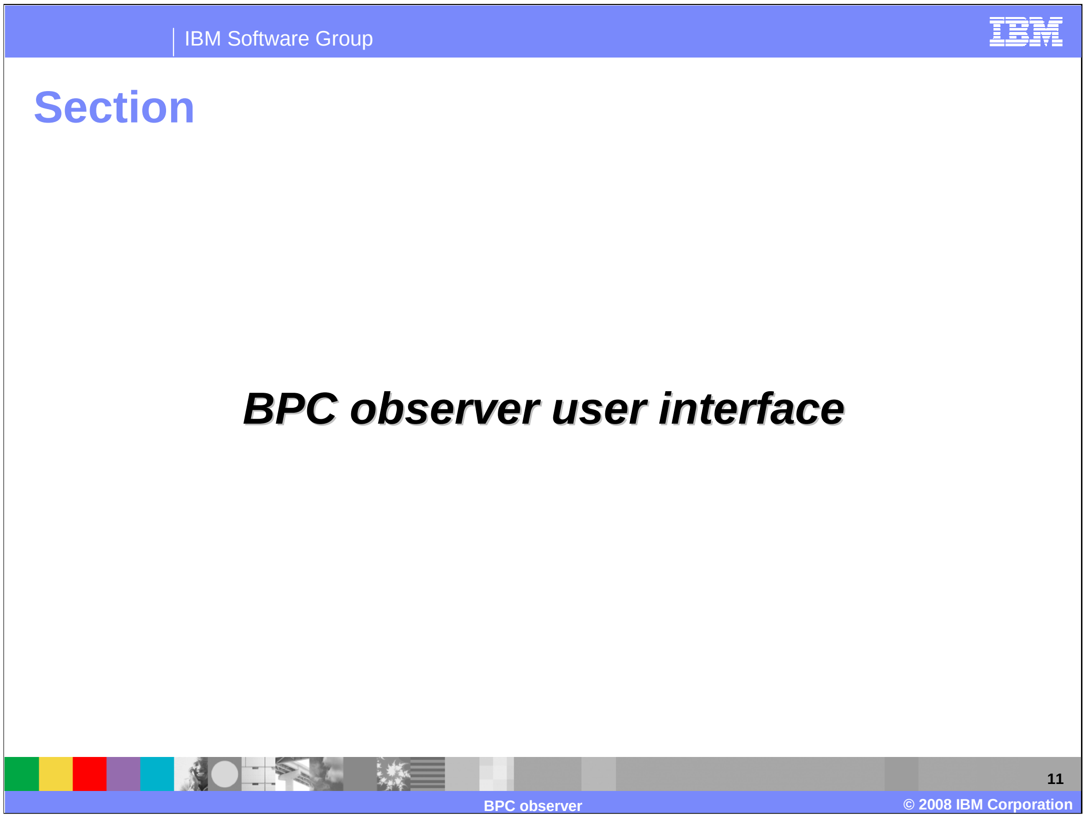
The BPC observer provides a Web application front end. The Web application uses the Java Server Faces, or JSF, technology and especially the BPC JSF components to create its user interface. An Enterprise Java Bean, or EJB, encapsulates the access to the BPC observer data store. A single Java EE enterprise application bundles the EJB and the JSF application into the BPC observer user interface. The Observer UI allows you to search through the Observer data store using queries, displaying the results in tabular views or charts. It also provides a query creation wizard that lets you define your own reports. The definition of these reports can be made persistent in the Observer data store. Those persisted user-defined reports are also available for running in the Web application. By defining your own reports, you can adapt the BPC observer to your specific needs.



BPC observer architecture – Data store

- Supported databases
  - Derby, DB2®, and Oracle
  - Same as CEI supported databases
- Database scripts
  - <install>/dbscripts/ProcessChoreographer/<db_type>
- Cleanup utility
  - A Jython script and MBean available
  - Used to remove old or completed data

The BPC observer data store is a set of database tables that store the event data emitted from the BPC components and some views that provide a unified interface to the data. The BPC observer supports the same databases as for CEI, which are Derby, DB2, and Oracle. The same database instance can even be shared with BPC. One thing to note here is that Derby is not supported for production systems. Database scripts that operate on the BPEDB are located in the directory specified on this slide. In addition to creation scripts, there are also cleanup scripts that will maximize performance of your system and clean up old, completed data from the BPEDB.



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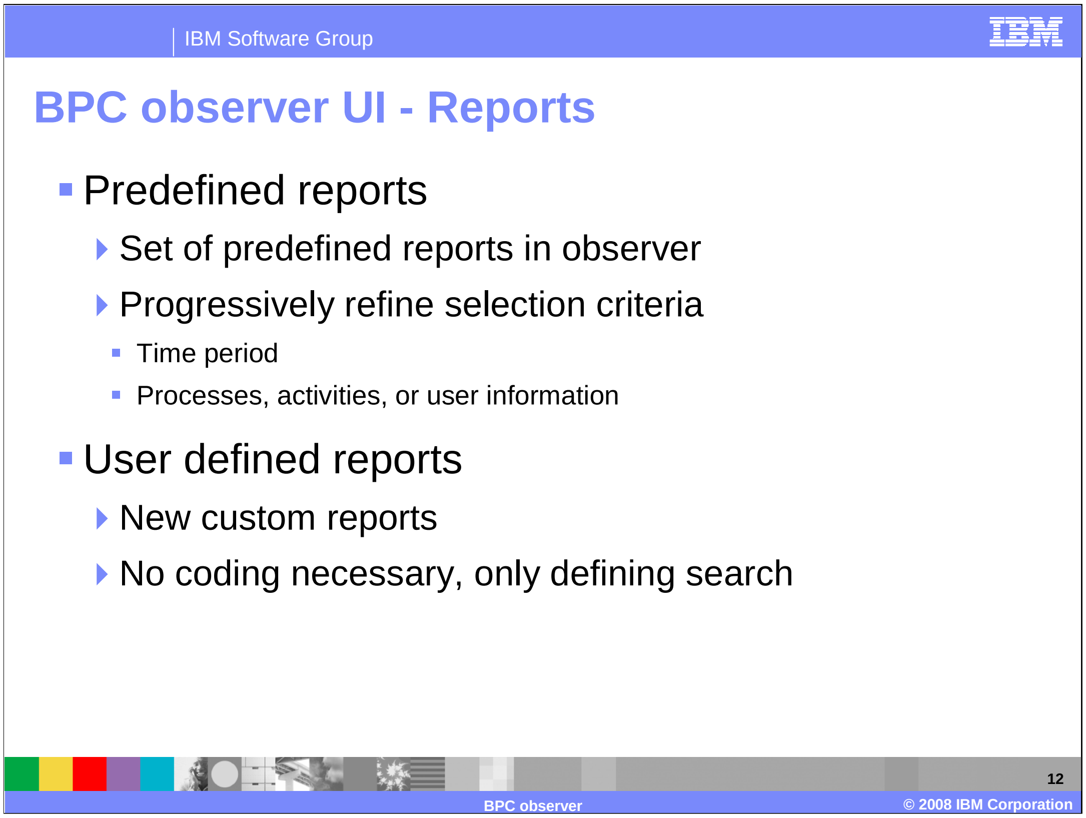
Section

BPC observer user interface

11

BPC observer

This section describes the user interface of the BPC observer.



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BPC observer UI - Reports

- Predefined reports
  - Set of predefined reports in observer
  - Progressively refine selection criteria
    - Time period
    - Processes, activities, or user information
- User defined reports
  - New custom reports
  - No coding necessary, only defining search

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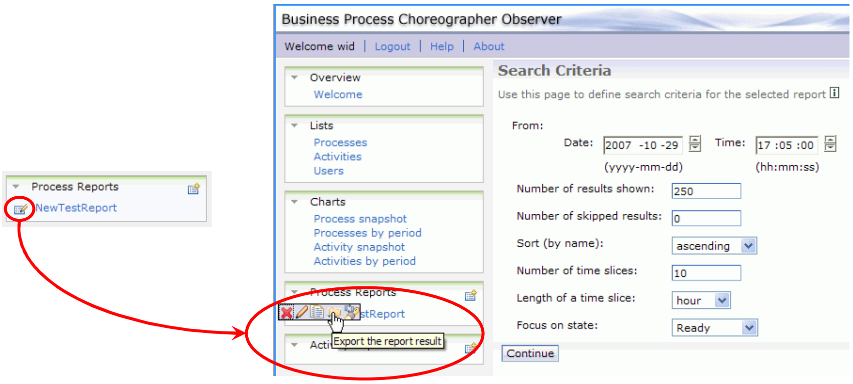
BPC observer

The BPC observer distinguishes between two types of queries. The first are predefined queries that cannot be modified by the user. These queries are used to provide the detail and chart display capabilities of BPC observer. The detail reports are a set of predefined reports in which you can progressively refine your selection criteria. The level of detail increases the farther you drill down. As an example, the welcome page displays some key properties of the observer database. After selecting the time period, you get a list of users involved. After selecting some users, you get information about the activities that those users were involved in. You can get detailed information for any single BPC activity.

The other type of query is the user-defined query. These queries define customized reports and show the extent of what is available in BPC observer for reporting. Without specifying a complex SQL query, you have several options for creating user-defined reports according to your needs. As an example, you can see a list of the number of activities claimed during a given time period and the status of the activities.

BPC observer UI - Reports

- Exporting report results
  - Using the BPC observer, position the cursor over a report, then click on the ✎ icon. In the resulting tool bar, select the “Export the report result” option.



Search Criteria

Use this page to define search criteria for the selected report

From:

Date: 2007 -10 -29 (yyyy-mm-dd) Time: 17 :05 :00 (hh:mm:ss)

Number of results shown: 250

Number of skipped results: 0

Sort (by name): ascending

Number of time slices: 10

Length of a time slice: hour

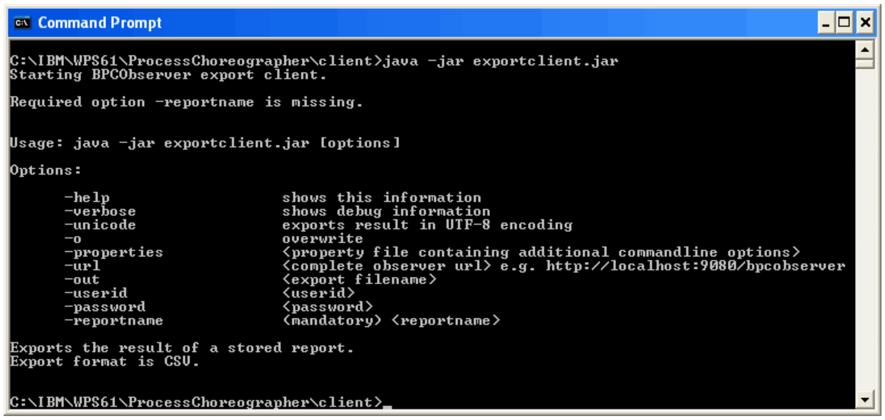
Focus on state: Ready

Continue

Whether a query is predefined or user-defined, report results can be exported into a CSV (comma separated values) text file. The results can then be imported into a spreadsheet program for further analysis and charting. There are three ways to export report results. The first is by clicking on the “Export” button in the results page of a report. This works for both predefined and user-defined reports, and in fact is the only way to export the results of a predefined report. The second way is available only for user-defined reports, and is pictured on this slide. Position the cursor over a report, then click on the icon that looks like a spreadsheet. In the resulting tool bar, select the “Export the report result” option. You will then be prompted to specify a file name and destination directory for the resulting file. The third way is to use a command line client application, which is described in more detail on the next slide. As with the method pictured on this slide, the command line client application is only available for user-defined reports.

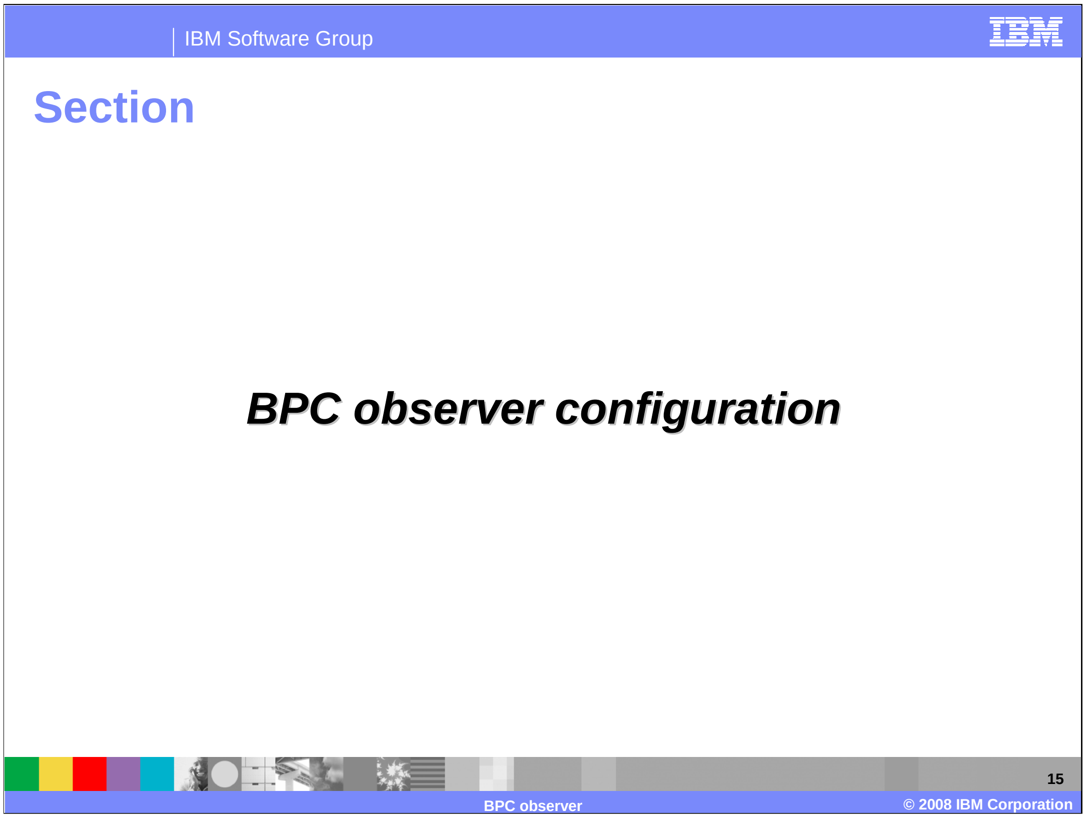
BPC observer UI - Reports

- Exporting report results
  - Can be automated by executing this command:
    - `<wps_install_root>/ProcessChoreographer/client/exportclient.jar` (in 6.1)
    - `<wps_install_root>/ProcessChoreographer/util/bpcobserverexporter.jar` (in 6.1.0.1+)



```
C:\IBM\WPS61\ProcessChoreographer\client>java -jar exportclient.jar
Starting BPCObserver export client.

Required option -reportname is missing.


Usage: java -jar exportclient.jar [options]

Options:

        -help                           shows this information
        -verbose                        shows debug information
        -unicode                        exports result in UTF-8 encoding
        -o                              overwrite
        -properties                     <property file containing additional commandline options>
        -url                            <complete observer url> e.g. http://localhost:9080/bpcobserver
        -out                            <export filename>
        -userid                         <userid>
        -password                       <password>
        -reportname                     (mandatory) <reportname>

Exports the result of a stored report.
Export format is CSV.


C:\IBM\WPS61\ProcessChoreographer\client>_
```

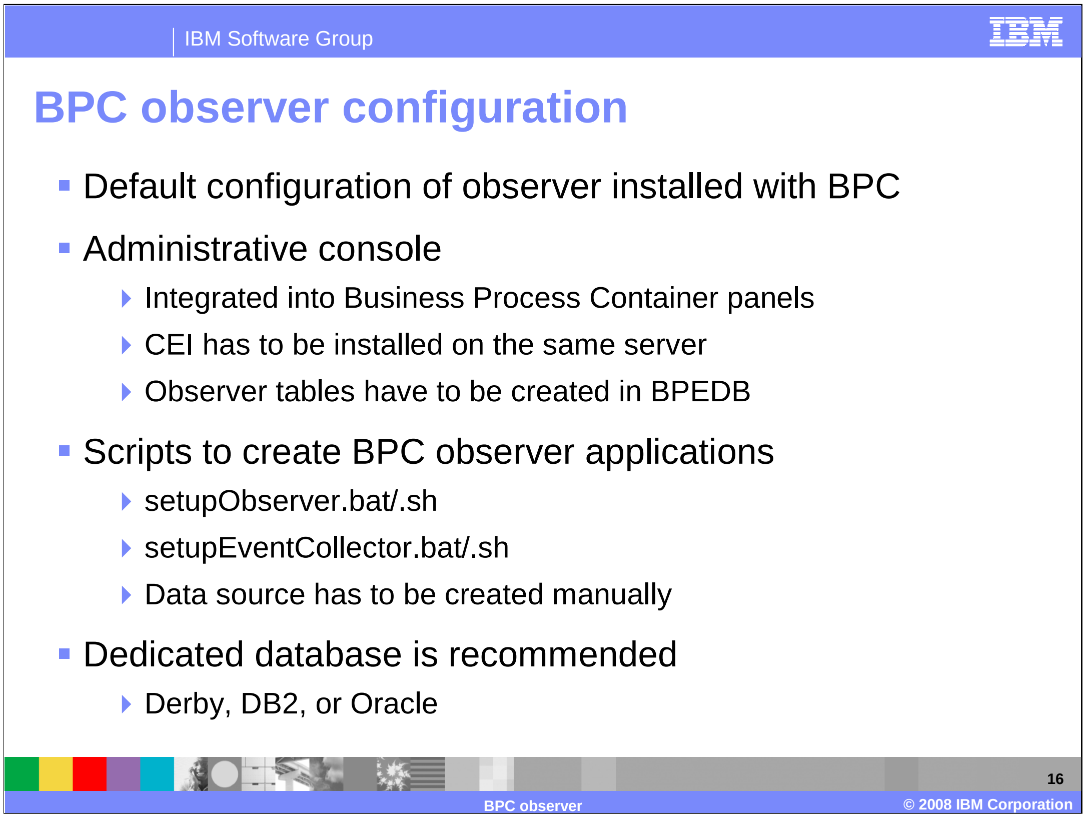
The exporting of report results can be automated by running a client program from the command line. The client program is in a JAR file called exportclient.jar in version 6.1 and bpcobserverexporter.jar as of Fix Pack 1 (that is, version 6.1.0.1 and beyond). In version 6.1, the JAR file is located in the ProcessChoreographer/client subdirectory under the WebSphere Process Server installation root directory. In version 6.1.0.1 and beyond, the JAR file is located in the ProcessChoreographer/util subdirectory. Running the client program without parameters displays the valid options and their meanings, as shown in the slide. Report generation can be automated by running the client program using a scheduling mechanism like the Windows Scheduler or a UNIX cron job.



Section

BPC observer configuration

This section describes the configuration of the BPC observer.



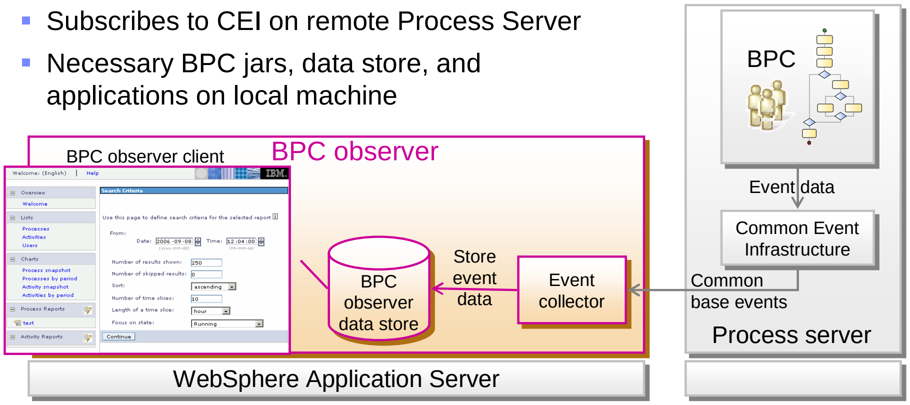
BPC observer configuration

- Default configuration of observer installed with BPC
- Administrative console
  - Integrated into Business Process Container panels
  - CEI has to be installed on the same server
  - Observer tables have to be created in BPEDB
- Scripts to create BPC observer applications
  - setupObserver.bat/.sh
  - setupEventCollector.bat/.sh
  - Data source has to be created manually
- Dedicated database is recommended
  - Derby, DB2, or Oracle

The installation and configuration of the BPC observer components is integrated into the overall BPC configuration. The BPC configuration panels available in the administrative console of WebSphere Process Server allow you to set up a default BPC observer configuration. For more complex situations, a configuration script is available. This allows you to create the BPC observer data store in an existing database instance and to deploy the BPC Event Collector and the BPC Observer UI. The BPC Event Collector and the BPC Observer UI are contained in their own standard Java EE .ear file and are therefore administered using the standard administration capabilities of WebSphere Application Server. Configuration scripts are provided for deploying the applications. These scripts can be called stand-alone or as part of the overall BPC configuration.

BPC observer configuration

- WebSphere Process Server remote client installation
  - Observer and BPC part of remote installation
  - Remote BPC observer acts as if on other machine
    - Subscribes to CEI on remote Process Server
    - Necessary BPC jars, data store, and applications on local machine

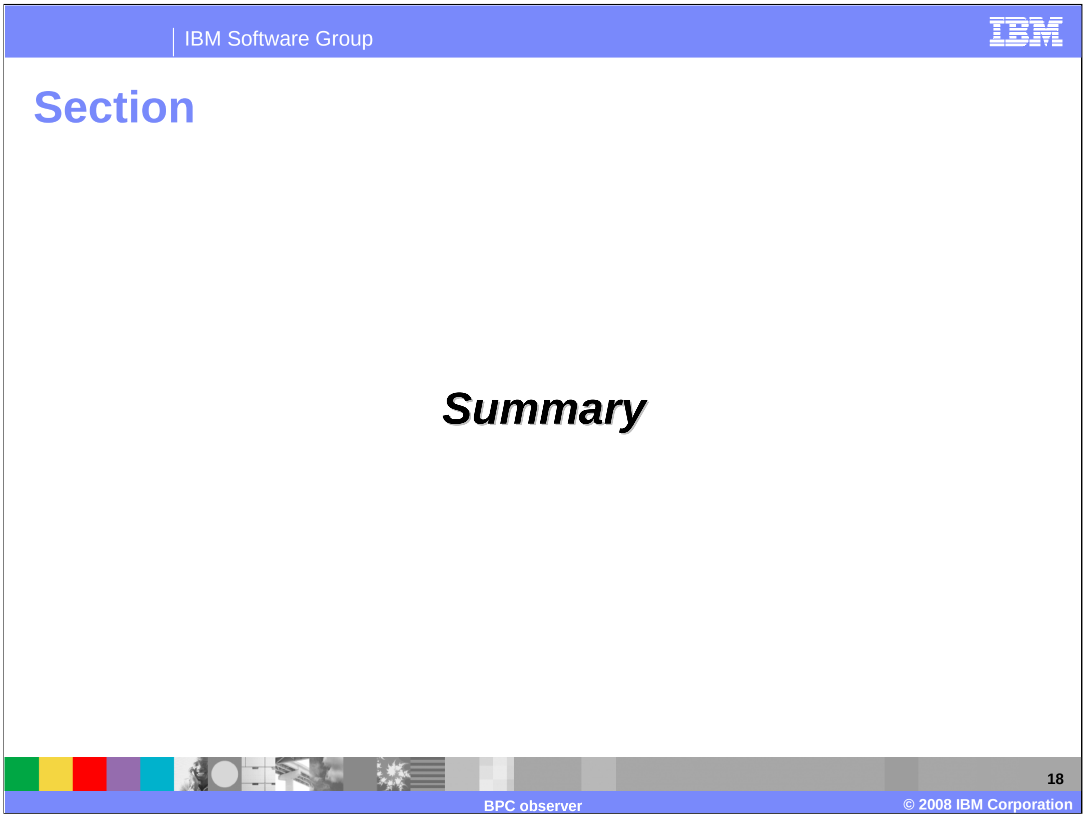


Search Criteria

Use this page to define search criteria for the selected report

From:
Date: 2006-09-08 (yyyy-mm-dd) Time: 12:04:00 (hh-mm-ss)
Number of results shown: 250
Number of skipped results: 0
Sort: ascending
Number of time slices: 10
Length of a time slice: hour
Focus on state: Running

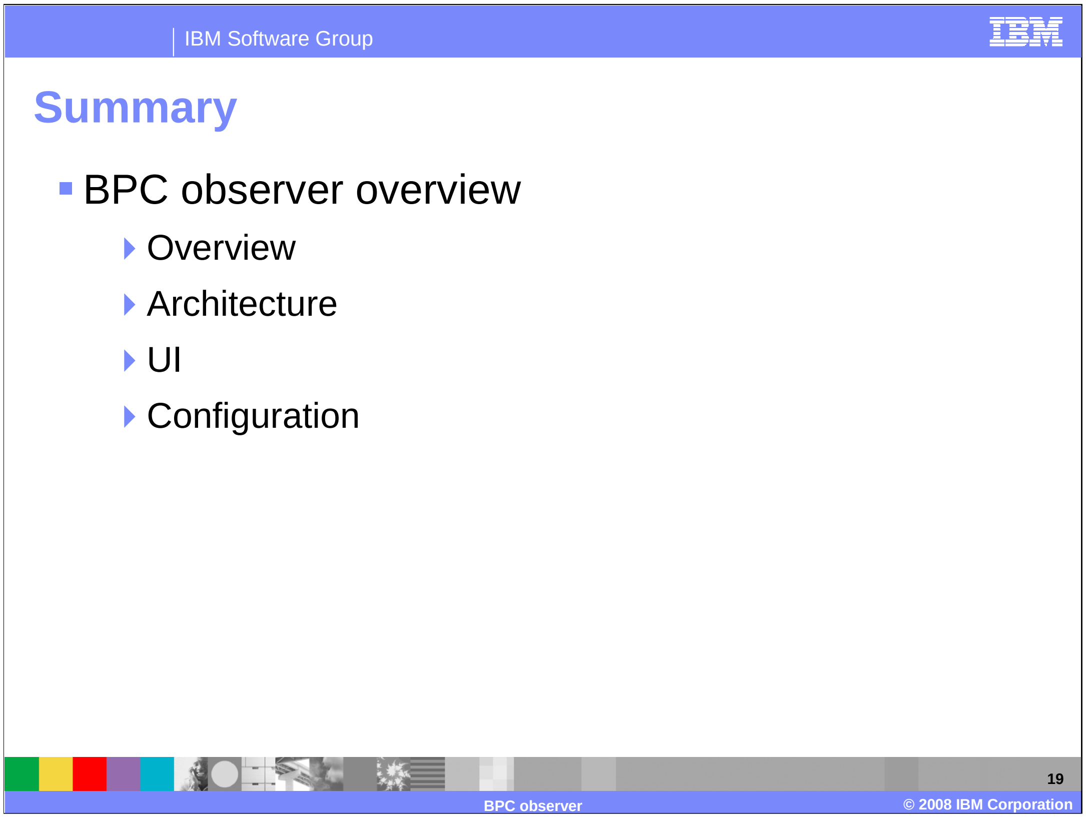
The remote client installation of WebSphere Process Server includes the business process choreographer. The BPC observer is part of the remote business process choreographer installation and acts as if it were not on a remote machine but on the same WebSphere Process Server machine. The remote BPC observer subscribes to CEI on a remote WebSphere Process Server instance, and runs off the necessary BPC jars, data store, and applications on the local machine.



Section

Summary

This section provides a summary of this presentation.



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Summary

- BPC observer overview
  - Overview
  - Architecture
  - UI
  - Configuration

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BPC observer

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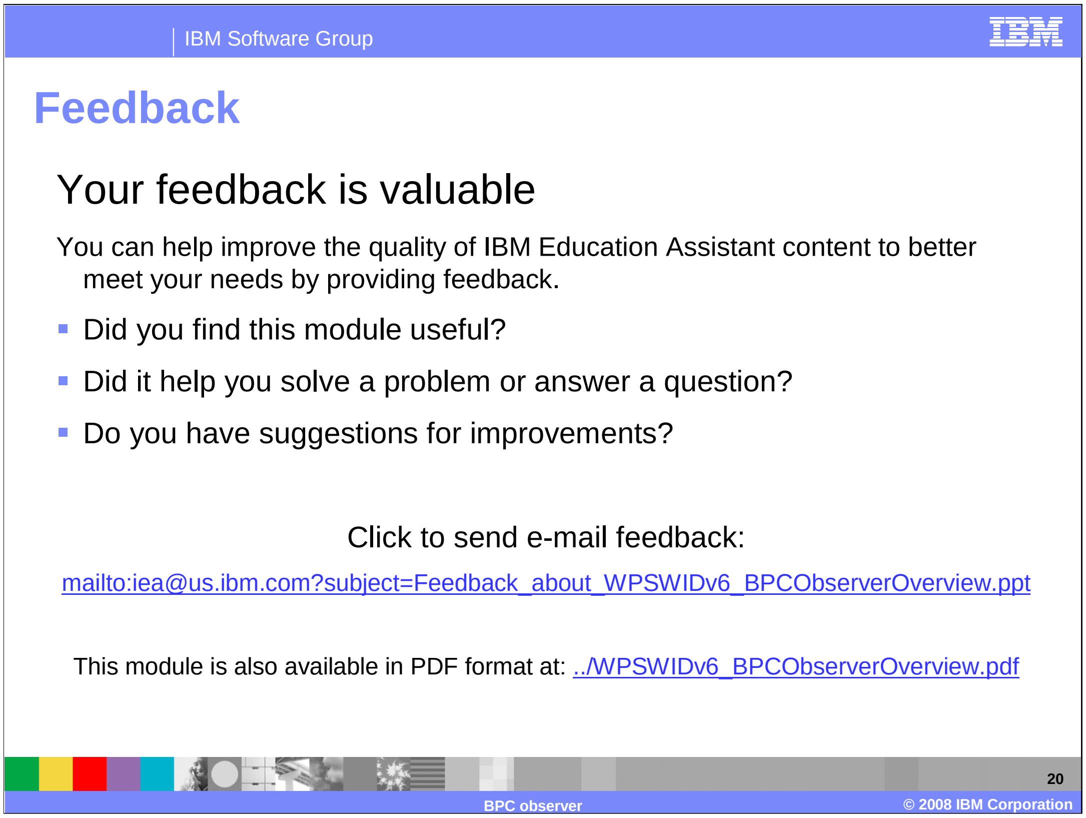
In summary, you have learned what the BPC observer is, what it does, and the basics of how it works. The major functions of the BPC observer are to record and transform CEI events, use reports to retrieve statistical data on processes and activities, and to display query results in tabular lists or statistical graphs. The BPC observer is delivered in two parts, the BPC Observer UI and the BPC Event Collector. Report results can be viewed using the BPC observer Web application, or they can be exported for viewing in a spreadsheet application. Finally, BPC observer configuration is now integrated with the configuration of BPC itself.



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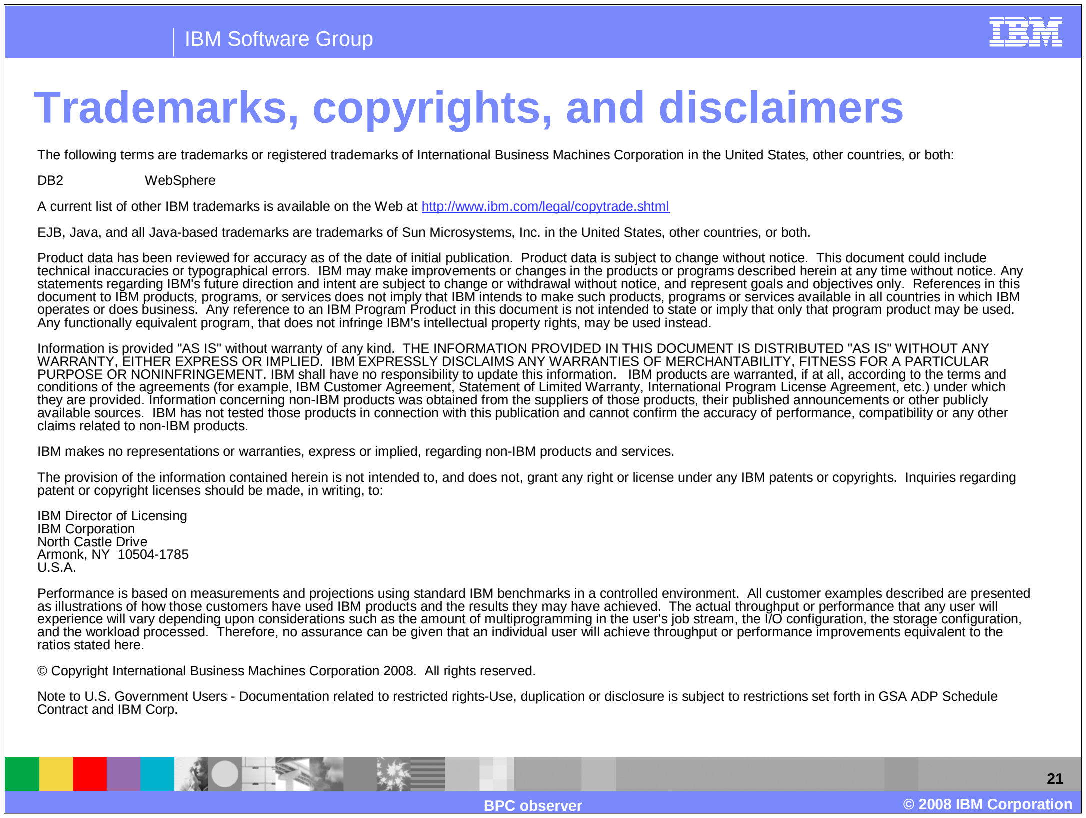

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