Workforce Central®

Installation Planning Guide

A guide to Workforce Central requirements and features.

Kronos Workforce Central suite version 8.0
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The Workforce Central suite is a comprehensive solution for managing every phase of the employee relationship—staffing, developing, deploying, tracking, and rewarding employees. It consists of a number of separate, yet tightly integrated applications that are both extensible and unified to provide a centralized data repository and flexible self-service capabilities.

Most Workforce Central products use a common software architecture platform. When you install Workforce Timekeeper, the installation program delivers this common platform.

This document describes the system requirements and background information that you need to know before you install Workforce Central v8.0 products. Workforce Central v8.0 supports different operating environments, all configured in a number of different ways. Planning your Workforce Central v8.0 environment is important to a successful installation.
About this guide

This book consists of the following chapters:

• Chapter 1, “About Workforce Central,” on page 13
• Chapter 2, “Workforce Timekeeper and other Labor and Scheduling products,” on page 37
• Chapter 3, “Workforce HR/Payroll,” on page 69
• Chapter 4, “Workforce Central Licensing,” on page 91
• Chapter 5, “SSL security considerations,” on page 103
• Chapter 6, “Preinstallation requirements and checklists,” on page 115
About the Workforce Central installation documentation

You should review the content of this document before you install any Workforce Central products, paying particular attention to the chapters about the products that you are installing or upgrading.

You can download the instructions for installing or upgrading Workforce Timekeeper, Workforce HR/Payroll, and other products from the Kronos customer portal or access them directly from the installation DVD.

Depending on the product or combination of products you are installing, select the applicable installation or upgrade scenario from the following books:

---

**Note:** Before you start to install or upgrade your Kronos products, check the Kronos customer portal for any revisions to these books.

- **The Workforce Central Installation Guide** describes how to install Workforce Central v8.0 on a Windows machine that does not include an earlier version of Workforce Central.

  This book includes instructions for installing the Timekeeper, Scheduler, Forecast Manager, Task Management, Budgeting, Leave, Attendance, Activities, Device Manager, Integration Manager, Process Designer and Interface Designer from a graphical installer or from a command line.

  **Important:** If you are installing Workforce HR/Payroll, you must install Workforce Timekeeper first.

- **The Workforce Central Upgrade Guide** describes how to upgrade Workforce Central v6.2 – v7.0 to Workforce Central v8.0 on a Windows machine.

  This book includes instructions for upgrading Timekeeper, Scheduler, Forecast Manager, Task Management, Budgeting, Leave, Attendance, Activities, Device Manager, Integration Manager, Process Designer and Interface Designer from a graphical installer or from a command line. It also includes instructions for using the Express Upgrade utility to automate and expedite the upgrade process.
About This Guide

- The Workforce HR/Payroll Installation Guide describes how to install Workforce HR v8.0 and Workforce Payroll v8.0 on a machine that does not include an earlier version of Workforce HR/Payroll.

  **Important:** If you are installing Workforce HR/Payroll, you must install Workforce Timekeeper first.

- The Workforce HR/Payroll Upgrade Guide describes how to upgrade from Workforce HR/Payroll v6.2 – v7.0 to v8.0. Because Workforce Central is a prerequisite for Workforce HR/Payroll v8.0, you must upgrade Workforce Central to v8.0 (as described in the Workforce Central Upgrade Guide) **before** you upgrade Workforce HR/Payroll.

- The Workforce Central UNIX/Linux Installation and Upgrade Guide describes how to install or upgrade the Workforce Central suite on AIX or Linux machines.

- The Workforce Worksheet Installation and Configuration Guide describes how to install the Worksheet plug-in to generate Genies with Microsoft Excel.

- The Enterprise Archiver User Guide describes how to install and upgrade Enterprise Archiver (which replaces Record Manager in v8.0)

- Workforce Central Installation Topics includes supplementary information, including how to:
  - Install and manage multiple instance of Workforce Central
  - Add Workforce Central products, languages, or service packs
  - Manage the notification server
  - Understand scalability and load balancing
  - Configure Workforce Central to use an SSL terminator
  - Configure Workforce Central to use an Oracle RAC database
  - Implement Transparent Data Encryption
– Change the JMX server password and port number.

Notes
• If you are a new Workforce Central or Workforce HR/Payroll customer, use the *Workforce Central Installation Guide*. If you are also adding HR/Payroll, use the *Workforce HR/Payroll Installation Guide* after you complete the Workforce Central installation.
• If you are an existing Workforce Central customer and are upgrading to v8.0, use the *Workforce Central Upgrade Guide*.
• If you are an existing Workforce HR/Payroll customer and are upgrading to v8.0, follow the *Workforce HR/Payroll Upgrade Guide* after you complete the Workforce Central upgrade.
Chapter 1

About Workforce Central

Workforce Central v8.0 technology advancements reduce the cost and complexity of integrating Workforce Central applications in your environment.

This chapter provides an overview of Workforce Central and contains the following sections:

- “Suite products” on page 14
- “Suite system requirements” on page 16
- “Server virtualization” on page 17
- “Workforce Central architecture” on page 18
- “Database support” on page 23
- “Multiple instances of Workforce Central products” on page 30
- “Reports” on page 35

Note: References to Workforce Central in this chapter include the products delivered by the suite installation kit: Timekeeper, Scheduler, Forecast Manager, Task Management, Budgeting, Leave, Attendance, Activities, Device Manager, and Integration Manager.
Suite products

The Workforce Central suite contains a number of products that can be organized into the following categories.

• **Time and labor products** — With Timekeeper and the optional Accruals, Attendance, Leave, and Activities products, an industry-standard web browser is used to record employee time, create schedules, track accruals, generate reports, approve time, and much more.

These products are installed from the Workforce Central Suite installation kit.

• **Scheduling products** — Although Timekeeper provides basic scheduling tools for employees who work predictable schedules, the optional Scheduler, Forecast Manager, Budgeting, and Task Management products provide tools for more complex scheduling where requirements vary depending on business demand.

These products are installed from the Workforce Central Suite installation kit.

• **Navigator framework** — The navigator user interface provides access to Workforce Central data that is focused, intuitive, and can be tailored to provide only the information that each user needs. Configurable user-specific navigators can display several task-oriented widgets, or views into Workforce Central, which enable managers and employees to complete their most frequent tasks quickly and efficiently. The navigator framework is installed when you install Timekeeper.

• **Workforce HR and Workforce Payroll** — These products deliver a complete infrastructure to help organizations optimize their workforce and enable communication and collaboration across the enterprise by streamlining the management of the employment life cycle by web-based self-service and reducing overhead by delivering content through a central portal.

Before you install these products from the Workforce HR/Payroll installation kit, you must install Timekeeper.

• **Workforce Central utilities** — Several utilities provide functionality that is common across the Workforce Central products. Enterprise Archiver provides the functionality needed to create an optimum archiving process. And Integration Manager and Interface Designer provide an easy-to-use, flexible
data integration tool that efficiently interfaces Kronos products with other critical business applications.

These products are installed from the Workforce Central Suite installation kit.

- **Data collection and self-service products** — These scalable data collection solutions focus on flexible self-service for the hourly worker, using the latest technology, and provide for web-based configuration and communication that is integrated into Workforce Central and interfaces with multiple other applications. Products include Workforce Employee, Workforce Manager, Kronos Touch ID, Kronos InTouch, and Device Manager.

  Device Manager is installed from the Workforce Central Suite installation kit and the other products are installed from their own kits.

- **Business intelligence and analysis products** — Analytics is the foundation product of all analytics products from Kronos. It extracts data from the Workforce Central database and transforms the data into a target data warehouse model that is designed for optimal reporting and analytics. Additional analytics products, such as Analytics for Retail, Analytics for Manufacturing, and Analytics for Healthcare, build on the features and functionality delivered with the core Analytics product.

  These products are installed from the Analytics installation kit.

Contact your Kronos Representative for more information about these Workforce Central products.
Suite system requirements

Workforce Central v8.0 applications require the following infrastructure:

- **Operating system** — Workforce Central applications run on Windows, AIX, or Linux.

- **Application server** — Workforce Central requires a J2EE-compatible application server. The Workforce Central installation program installs JBoss EAP 6.3 with the JDK 1.8 Update 31.

- **Web server** — Workforce Central applications use Microsoft IIS or Apache web server software.

- **Notification server** — Workforce Central uses Openfire server version 3.7.2 (which is based on XMPP—Extensible Messaging and Presence Protocol) as the notification server.

- **Database** — Workforce Central applications support a SQL Server or Oracle database.

For specific versions supported, see “System requirements” on page 40.

**Note:** If you use both Workforce Central and Workforce HR/Payroll, you must use a Windows system with a JBoss application server, Microsoft IIS web server, and SQL Server database.
Server virtualization

Virtualization is a software technology that makes it possible to run multiple operating systems and multiple applications on the same computer at the same time, increasing the utilization and flexibility of hardware. All tiers of the Workforce Central suite can be virtualized, including the web server, application server, and database server. By using virtualization software, an IT department can transform or “virtualize” the hardware resources of an x86-based computer—including the CPU, RAM, hard disk, and network controller—to create several fully functional virtual machines that can each run its own operating system and applications just like a “real” computer.

The following virtualization software is supported on Workforce Central v8.0:

- Microsoft Hyper-V 2012 (Windows Server 2012 or Windows Server 2012 R2)
- VMware vSphere v5+ and VMware ESXi Hypervisor 4.1+ (Windows Server 2012 or Windows Server 2012 R2)

Consult your Kronos Representative for the hardware requirements specific to your environment.

**Note:** Although Kronos generally recommends that dedicated servers be used for optimal performance, if Workforce Central will be deployed in a virtualized server environment, be careful not to over-commit server hardware resources. The Workforce Central virtual machine’s CPU and memory should be allocated or reserved with guaranteed availability of resources per recommendations from the sizing tools.

If adequate hardware resources are not available for Workforce Central and the VMs are over committed on resources, performance of Workforce Central applications will be negatively affected. Also, pay careful attention to the sizing tool’s hardware sizing recommendation; the latest generation multi-core Intel and AMD processors are required for optimal performance.

For specific recommendations, see *Workforce Central Performance Best Practices Guidelines & Hints and Tips.*
Workforce Central architecture

The Workforce Central suite is a Java 2 Enterprise Edition (J2EE) compatible set of applications that uses a three-tier structure:

1. **Client software** — The client accesses a Workforce Central application using a web browser. Application functions are implemented as HTML pages, Flash applications, or Java applets. The pages, applications, and applets connect to the web-based Workforce Central application. The applications and applets are downloaded via .swf and .jar files, respectively, and use a sticky cache, which means that the files are only downloaded the first time that the client accesses the application or applet.

   **Important:** Starting with Workforce Central v8.0.11, reliance on client-side Java has been eliminated and all Java applets have Java-free replacements. For more information, refer to the Workforce Central v8.0.11 release notes.

2. **Notification server** — Workforce Central communicates with the notification server to provide near real-time alerts and notifications to its users. Events within Workforce Central trigger notification messages, which are routed to the notification server. Notification messages, when specific users are online, are routed to users via email, Inbox, the navigator user interface, or as an SMS text message.

3. **Workforce Central platform and applications** — Contains the common infrastructure, applications, application server, and web server.

4. **Database** — Stores all of the application data.

**Client software**

The client layer contains browsers, operating systems, Flash Player plugin, Java Runtime Environment (JRE), and other supporting technologies (such as Adobe Acrobat Reader). Several Workforce Central products operate at the client level:

- **Process Designer** — The visual process design tool used to modify preconfigured process templates that are included with Process Manager.
- **Interface Designer** — The tool used to create custom interfaces for Integration Manager on a client machine.
• **Workforce Worksheet** — An Microsoft Excel plug-in that enables users to dynamically retrieve a number of Workforce Central reports and Genies using Microsoft Excel. Any Excel worksheet created from this data can be refreshed on demand or dynamically with live data from Workforce Central.

**Notification server**

The Workforce Central notification server is based on a third-party software product, IgniteRealtime OpenFire. OpenFire is an open source real-time collaboration server, widely used in messaging and chat applications. OpenFire is released under Apache license. Extensible Messaging and Presence Protocol (XMPP) is a communications protocol based on XML and open standards. This protocol was originally named “Jabber.”
Workforce Central platform and applications

The middle tier of Workforce Central v8.0 provides the business logic and connections to the back-end database. In order to make the Workforce Central products independent, yet tightly integrated, this tier of the suite architecture consists of three parts:

- A base platform, which consists of data, code, business logic, GUIs, and APIs
- A modular set of applications and components, installed as needed, that use various extensibility mechanisms
- “Loosely coupled” integration technologies that connect these pieces with each other and with third-party applications

Platform components

A set of common components is installed automatically when you install Workforce Central. It consists of the following set of layers, from lowest to highest:

- **J2EE layer** — The Java runtime and J2EE application container services, such as database connectivity, session management, servlets, and JSPs.
- **Kernel layer** — Basic domain-independent components (logging, persistence, etc.) and the UI, API, and extensibility frameworks.
- **Core business layer** — Business objects essential to all Kronos ERM applications (People, Organizations, Process Manager, and so forth) and business objects essential to the Kronos brand (HyperFind, Genies, etc.).
- **Shared business layer** — Business objects shared by two or more applications, but not universally used.

Workforce Central applications

The application layer (not part of the common platform itself), consists of major functional areas (Timekeeper, HR/Payroll, Scheduler, and so forth) that are installed and licensed separately and use the platform functionality in the layers below.
The application layer of a Workforce Central installation includes:

- A web server component that contains all static content and listens for browser requests and passes these requests to the application server.
- An application server component that contains all dynamic content and centralizes application services such as business components and access to back-end enterprise systems and uses technologies such as caching and connection pooling to improve resource use and application performance.

**Database**

Workforce HR/Payroll and Workforce Central use a single database.

- When only Workforce Central is installed, this database—which can be SQL Server or Oracle—contains the Workforce Central and platform tables. The Workforce HR/Payroll tables and application are not present.
- When both Workforce HR/Payroll and Workforce Central are installed, the schemas exist side-by-side in the database. You must use a SQL Server database for Workforce Central installations that include Workforce HR/Payroll.
- If you are using Workforce Central in a UNIX or Linux environment, you must use an Oracle database.

**Interapplication communication**

A complete installation of the Workforce Central suite includes many separate components that need to communicate with each other. Depending on the component, the following types of communication are used:

- **Database access (by JDBC)** — Database access is the most straightforward way for components to communicate. Each application is configured when it is installed with the location of its database.
- **Java RMI** — The Process Manager engine is the only component that uses RMI. Process Manager RMI is managed completely by the Process Manager engine, which locates other servers in its cluster from database tables in the Process Manager schema.
• **XML APIs (using the HTTP protocol)** — For XML APIs, the caller needs to identify the location of the target (web server or application server).

• **Common logon handshaking** — Workforce HR/Payroll uses common logon handshaking to communicate with the platform using HTTP. For the common logon handshaking, each application needs to identify the other to log on and maintain sessions between the two web servers. Properties files (configured when Workforce HR/Payroll is installed) store the locations and protocols for the two servers.

• **Workforce HR/Payroll private web service** — The Workforce HR/Payroll private web service is called by the platform when processing XML API requests implemented by Workforce HR/Payroll .NET business objects. The platform identifies the Workforce HR/Payroll server by using the same properties used by common logon.

• **Cookies** — A cookie is a small piece of information, often no more than a short session identifier, that the server sends to the browser when the browser connects for the first time.

  Workforce Central relies on cookies for session management. It uses cookies to track the user session ID and a Boolean logoff flag. The cookies are strictly session cookies and are not persistent, which means that they are not stored on the user’s system. A cookie is simply loaded into the browser’s cache and is active only as long as the session is active. After the user logs off, the cookie is gone.

  Workforce Central cookies are not encrypted in any way. There is currently no other encryption of logon information, cookies, or other data, outside a Secure Socket Layer (SSL) installation. If it is necessary to have any HTTP request or response information encrypted during transmission, you should implement SSL with the Workforce Central installation.

  If cookies are disabled, you can log on to Workforce Central, but the default Genie will not load and the following error message will be generated:

  **Cannot retrieve data from server.**

  To avoid this problem, ensure that cookies are enabled in your browser.
Database support

Workforce Central v8.0 requires a SQL Server or Oracle Relational Database Management Systems (RDBMS). Database considerations include:

- “Unicode compliance” on page 23
- “Disk allocation” on page 24
- “Database Manager” on page 26
- “Transparent Data Encryption” on page 29

Unicode compliance

Workforce Central v8.0 uses Unicode-compliant SQL Server and Oracle Relational Database Management Systems. Unicode is an industry standard that was designed to allow text and symbols from all the writing systems of the world to be consistently represented and manipulated by computers. The Unicode Standard includes character properties that enable Kronos databases to convert existing non-Unicode text characters to multibyte characters that are used in any major language text.

The database installation and upgrade procedures are not affected by the use of the Unicode multibyte characters. The following table lists the Kronos database documentation data type labels:

<table>
<thead>
<tr>
<th>Unicode Data Types</th>
<th>Non-Unicode Data Types</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SQL</strong></td>
<td></td>
</tr>
<tr>
<td>• nChar</td>
<td>• Char</td>
</tr>
<tr>
<td>• nVarChar</td>
<td>• VarChar</td>
</tr>
<tr>
<td>• nText</td>
<td></td>
</tr>
<tr>
<td><strong>Oracle</strong></td>
<td></td>
</tr>
<tr>
<td>• nChar</td>
<td>• Char</td>
</tr>
<tr>
<td>• nVarChar2</td>
<td>• VarChar2</td>
</tr>
<tr>
<td>• NCLOB</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 1  About Workforce Central

Disk allocation

With Workforce Timekeeper v8.0, you can specify the file groups that are needed for the installation or you can use RAID.

- **RAID storage** — Your specific RAID implementation will determine how to allocate the required tablespaces.

- **Non-RAID disk allocation** — If you are not using RAID, Kronos recommends that you use at least nine disks when installing a Workforce Timekeeper database. Assign file groups `tkcs1–tkcs9` to each disk.

Refer to the *Workforce Central Installation Guide* for more information.

RAID considerations

RAID technology combines two or more physical hard disks into a single logical unit. Although many RAID implementations are available, Kronos recommends using hardware level RAID storage or SAN disk storage with production quality drives.

The following lists some sample RAID configurations for various-sized installations. See your Kronos Representative for recommendations specific to your environment.

- **Small installation (fewer than 5,000 employees)**
  - A hardware RAID controller with at least three drives for the database storage. (Disk I/O performance improves as the number of disks increases.)
  - A logical drive created as a RAID partition with the available drives should be used for all the tablespaces in Oracle and file groups in SQL Server.

- **Medium installations (5,000–20,000 employees)**
  - One or more hardware RAID controllers with five or more disk drives for database storage. (Disk I/O performance improves as the number of disks increases.)
– A logical drive created as a RAID partition with the available drives should be used for all the tablespaces in Oracle and file groups in SQL Server.
– SAN storage also may be used for database disk storage. (With SAN, disk I/O performance improves as the number of disks increases.)
– Log files should be located on logical units (LUNs) that are separate from the data LUNs.
– A striped RAID configuration for database files (for example, RAID 5 or 10) and a mirrored configuration for log files (RAID 1 or 10).

• Large installations (more than 20,000 employees)
  – One or more hardware RAID controllers with seven or more disk drives for database storage. (Disk I/O performance improves as the number of disks increases.)
  – A logical drive created as a RAID partition with the available drives should be used for all the tablespaces in Oracle and file groups in SQL Server.
  – SAN storage also may be used for database disk storage. (With SAN, disk I/O performance improves as the number of disks increases.)
  – Log files should be located on drives that are separate from the data.
  – Log files should be located on logical units (LUNs) that are separate from the data LUNs.
Database Manager

The Workforce Central installation program installs the Database Manager utility. Database Manager is used to manage the Workforce Central database for:

- **New installations** — For new installations, run Database Manager to create the necessary tables and keys within the database instance.

- **Upgrades** — When you upgrade from an earlier version of Workforce Central, run Database Manager to upgrade the database.

  Database Manager converts all database objects (tables, keys, stored procedures, triggers, and so on) and data from one release of Workforce Central to another release. It examines the database to determine what was upgraded by looking at the `KCSUPGRADEHISTORY` table. It understands the dependencies between different versions of different applications, and can run the appropriate upgrade scripts (or warn about incompatibilities).

- **Service packs** — When you apply a service pack, the service pack installation procedure updates Database Manager. You then run Database Manager to apply the corresponding service pack changes (including database scripts).

  Uninstalling a service pack restores the database to its pre-service pack state but does not remove service pack changes from Database Manager (including database scripts).

  **Important**: If you are installing a service pack, refer to the service pack release notes before running Database Manager.

- **Enterprise Archive** — If you use the Enterprise Archive product to archive your Workforce Central data, you use Database Manager to populate the target, production, and archive databases. See the `Enterprise Archive Installation Guide` for more information.

  Database Manager also has a “reconcile” feature to verify that an existing database is installed correctly and contains all the necessary objects. It analyzes
the database to detect altered indices, added columns, or extra tables that may have been inadvertently or intentionally changed.

Notes

• To install Database Manager, at least one Workforce Central product must be installed. If you install the application server, web server, and notification server on different machines, Database Manager is installed on all machines.

• Workforce Central does not need to be running in order to use Database Manager.

• Database Manager is not associated with a specific instance of Workforce Central. You can use the same installation of Database Manager to install or upgrade any SQL Server or Oracle database.

• Segment maintenance is not run by default when you run Database Manager. If you need to change or add segments, select Options > Segment Maintenance and modify the Configured column.

• To uninstall Database Manager, you must uninstall Workforce Central.

Refer to any of the installation or upgrade documents for more information about using Database Manager.

SEQUENCE count repair

Database Manager reconciles the SEQUENCE counter column for each table maintained in the SEQUENCE table against the actual maximum primary key of those tables. In cases where the counter column is less than the maximum primary key value for the table, it displays the anomaly along with repair SQL in the log.

In addition to reporting this, Database Manager provides an option to fix the SEQUENCE table automatically. This executes the SQL reported in the log against the out of SEQUENCE table rows.

Reconciliation component

Database Manager supports reconciliation of the current database configuration to metadata supplied by each version/release of Workforce Central components. This process starts when the installation or upgrade is finished, to validate that the
database contains what it should. You can also run this process on an *ad hoc* basis by logging on to Database Manager and clicking the Reconcile option.

The results of the reconcile are written to the `DBManager_timestamp.log` file, as described in “Logging of Database Manager results” on page 28.

**Segment mapping**

Previous releases of Workforce Central required a specific group of segments to be defined in the tablespace. In Workforce Central v8.0, this is no longer required.

With Workforce Central v8.0, you can specify the actual database segments (tablespaces in Oracle or file groups in SQL Server). A Database Manager mapping workspace displays the virtual segment in the installation next to a mapping drop-down box that allows you to select where those objects should be installed.

This means that segments defined to the application as TKCS1 could be installed in SYSTEM (Oracle) or PRIMARY (SQL Server) if you do not want to maintain separate segments. In general, this varies depending on whether or not you use RAID (Redundant Array of Independent Disks).

**Logging of Database Manager results**

All Database Manager logs are written to the application server machine in the `\Kronos\dbmanager` folder. The naming convention of the logs is:

```
process_DBserver_DBname_DBuser.log
```

where

- `process` is reconcile, summary, or detailed.
- `DBserver` is the name of the database server.
- `DBname` is the name of the database or schema.
- `DBuser` is database owner.

The upgrade process creates a summary log and a detailed log. The reconcile process only creates a reconcile log. Logs are rolled over after five logs.
Transparent Data Encryption

Workforce Central supports the use of Transparent Data Encryption (TDE), a feature that protects data on the hard disk and backup media. The files are encrypted with a certificate, and the database can only be accessed with that certificate. The actual encryption/decryption occurs as the pages of the data or log files are written to or read from the I/O system. The data inside the cache is in normal plain text while the data on the disk is in encrypted form.

The process for enabling TDE is different for SQL Server and Oracle. SQL Server uses TDE to encrypt the data, log, and backup files of the entire database. Although Oracle can define its use of TDE at the column level, Workforce Central databases should be encrypted at the tablespace level.

For information about implementing TDE, refer to Workforce Central Installation Topics.

**Important:** TDE is only supported on SQL Server Enterprise Edition.
Multiple instances of Workforce Central products

Depending on the Kronos products that you purchased as well as a number of other factors, Kronos provides hardware recommendations that are specific to your environment to accommodate the anticipated load on the system. These recommendations may include installing more than one instance of your Workforce Central products. These instances can be installed on different physical machines or the same physical machine.

Refer to your Hardware Recommendations Report or contact your Kronos Representative for guidelines specific to your environment.

Except for Device Manager, multiple instances of Workforce Central products that connect to the same database must include the same Workforce Central products, service packs, and languages. This is true whether they are installed on separate machines or on the same machine. Device Manager can be installed on a dedicated machine.

For information about implementing multiple instances, refer to Workforce Central Installation Topics.

General guidelines

Guidelines to consider before installing multiple instances of Workforce Central include:

- Instances do not share static application resources. Static resources are served by the web server and include Help files, images, HTML pages, JavaScript files, client .jar files, JRE plug-in, and so forth. Each instance must have its own complete copy of all static resources.

  This means that if the web server is on a machine that is separate from the application server and you create a second instance on the application server, you must also create a second instance on the web server.

- Each instance can be configured separately and independently by established configuration mechanisms such as System Settings and custom properties files.
• You cannot remove products that are prerequisites for other products nor can you add products that require products that are not installed.

• Multiple instances can run concurrently. That means that user A can log on to instance 1 at the same time that user B logs on to instance 2. Kronos does not, however, support multiple browsers that are open on the same physical machine.

• You cannot install multiple instances in different locations in the file system. For example, you cannot install one instance of Workforce Central in `c:/Kronos/wfc` and another in `d:/Kronos/wfc`. All instances must be installed in the same Kronos installation directory.

**Licensing multiple instances**

Each instance of Workforce Central requires separate license files and all instances that connect to the same database must include the same set of license files. License files are stored in the `\\Kronos\instance_name\licensing` folder; for example, `\\Kronos\wfc\licensing`.

If you create a new instance that points to a different database, you must obtain a new license from Kronos.

**Important:** Licenses are assigned per employee. Each employee that uses the Workforce Central system must have a valid employee license for each product that the employee uses.

**Database functionality**

The following guidelines describe database functionality with the multiple instance capability:

• Different instances can point to different databases that use the same database platform. For example, instance 1 can point to SQL Server database “fred” and instance 2 to SQL Server database “mildred.”

• Different instances can point to databases that use the same database platform, but are installed on different database servers. For example, instance 1 can point to SQL Server database “fred” on server 1 and instance 2 to database “fred” on server 2. The database servers must be at the same version.
• Different instances *cannot* point to different database platforms. For example, instance 1 cannot point to a SQL Server database, and instance 2 to an Oracle database.
Create and manage multiple instances

The server run-time code for each instance of Workforce Central is contained in a file called **wfc.ear**. The wfc.ear file for the first instance is created by the Workforce Central installation program. Each subsequent instance of Workforce Central uses its own wfc.ear file.

To create, modify, rebuild, or delete instances, you can use either of the following Workforce Central utilities:

- **Configuration Manager graphical user interface** — For single-server or environments with limited numbers of servers, the easy-to-use Configuration Manager GUI prompts you to input or select specific information. When you use Configuration Manager to create or modify instances, the system always creates a new wfc.ear file and you must create or modify one instance at a time.

  For more information about the Configuration Manager GUI, refer to any of the Workforce Central installation or upgrade documents.

- **Express Installer command line interface** — For more complex or hosting environments, the Express Installer CLI requires you to enter the necessary information into a text file called “options” file (.opts) and enter specific commands in a command window. When you use the Express Installer CLI to create or modify instances, you can reuse a wfc.ear file or create a new one. You can also create or modify multiple instances at the same time (in parallel).

  For more information about the Express Installer, refer to *Using the Workforce Central Express Installer*.

The following table shows some key differences between the Configuration Manager GUI and the Express Installer CLI:

<table>
<thead>
<tr>
<th>Task</th>
<th>Configuration Manager GUI</th>
<th>Express Configuration Manager CLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create new wfc.ear</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Reuse existing wfc.ear</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Run in parallel</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
The Configuration Manager GUI is easier to use, but the Express Configuration Manager is considerably faster, especially if you are configuring numerous instances.

Consider the following scenario, where you are creating three instances:

<table>
<thead>
<tr>
<th>Configuration Mgr</th>
<th>Instances Created</th>
<th>Elapsed Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUI</td>
<td>wfc2   wfc3   wfc4</td>
<td>5 minutes 5 minutes 5 minutes</td>
</tr>
<tr>
<td>Express Installer</td>
<td>wfc2   wfc3   wfc4</td>
<td></td>
</tr>
</tbody>
</table>

When you use the Configuration Manager GUI to create the three instances, the process is serial and each instance takes 5 minutes\(^1\) to create, for a total of 15 minutes. When you use the Express Configuration Manager, you can create each instance in parallel, for a total of 5 minutes*. You do this by running the command line in three separate command windows or by creating a script.

---

1. The actual time depends on your environment.
The reporting functionality of Timekeeper v8.0 is based on the report definition language (RDL), which is an XML schema from Microsoft for representing reports. The following versions of RDLC are supported:

- RDLC 2010
- RDLC 2005 (for custom reports only)

Workforce Worksheet, a Microsoft Excel reporting extension first introduced in Workforce Central v6.1, now supports Excel 2010.

Workforce HR/Payroll uses Crystal Reports as its reporting mechanism and does not use RDL functionality.
Chapter 2

Workforce Timekeeper and other Labor and Scheduling products

Note: References to Workforce Central in this chapter include Timekeeper, Scheduler, Forecast Manager, Budgeting, Task Management, Leave, Attendance, Activities, Device Manager, and Integration Manager.

Workforce Central can be installed with a variety of configurations, operating systems, and underlying software. Therefore, it is important that you plan your environment before you start installing any products.

The following sections describe the various installation options and requirements:

- “Client-side Java” on page 38
- “System requirements” on page 40
- “Database options” on page 50
- “Workforce Central installation requirements” on page 54
- “Configuration options” on page 57
- “Install Workforce Central products” on page 58
- “Install Workforce Central products” on page 58
- “Reports” on page 61
- “Language support” on page 62
- “Service packs” on page 63
- “Load balancing” on page 65
- “Background Processor” on page 66
- “Dedicate machines to certain functions” on page 67
Client-side Java

Previous versions of Workforce Central relied heavily on client-side Java. With Workforce Central v8.0, most applications are Java-free and most users will not encounter Java-related issues. With Workforce Central v8.0.11, all reliance on client-side Java has been eliminated.

Workforce Central v8.0 through 8.0.10

In versions 8.0 through 8.0.10, several components continue to require Java:
1. Workload Planner, which is a part of Scheduler.
2. QuickTime Stamp Offline
3. The following Setup pages, which are used by administrators or Kronos support:
   - Availability Templates
   - Event Manager
   - HyperFind Queries
   - Jobs and Organizational Map
   - Labor Level Sets
   - Organizational Sets
   - Pattern Templates
   - Process Profiles
   - Query Manager
   - Report Setup
   - Schedule Periods
   - Shift Templates
   - Table Import
   - Workflow Notifications
Workforce Central v8.0 through 8.0.11 and higher

With Workforce Central v8.0.11, reliance on client-side Java has been eliminated and all Java applets have Java-free replacements, including:

- Workload Planner, which is a part of Scheduler
- Quick Timestamp Offline – A new installation kit is available. For more information, see the Quick Timestamp Offline System Administrator Guide.
- All Setup pages are Java-free.

The process to replace client-side Java, which began with Workforce Central v8.0, has been completed and the remaining setup pages have been redesigned and are Java-free. When you apply the v8.0.11 service release, these Setup pages will be replaced automatically with the non-Java version. Functionality is unchanged.
System requirements

This section describes the client, application, database, and network requirements for Workforce Timekeeper and other Workforce Central products.

- “Client software requirements” on page 41
- “Server system requirements” on page 42
- “Database system requirements” on page 44
- “Workforce Worksheet system requirements” on page 46
- “Network requirements” on page 47
- “Active Directory” on page 47
- “Authentication” on page 48
- “Citrix MetaFrame support” on page 49
- “Java 1.8 (Workforce Central 8.0 through 8.0.10)” on page 49

**Note:** Earlier versions of Workforce Central used the term *application server* to describe the entire Workforce Central application, which included third-party application server software and web server software, all installed on one machine. Although Workforce Timekeeper v8.0 continues to support this configuration, it also allows you to install the application server, web server software, and notification server on separate machines, as well as to install multiple instances of the application on the same machine.

Therefore, in Workforce Central v8.0, the term *application server* is only used to refer to the J2EE application server software—not the Workforce Central application.
### Client software requirements

The client layer of the Workforce Central products contains browsers, operating systems, a Java Runtime Environment (JRE), and other supporting technologies. Workforce Central products support the Java-Client user interface, HTML-Client user interface, and the navigator framework (which uses Flash and HTML5 technology).

**Important:** Starting with Workforce Central v8.0.11, reliance on client-side Java has been eliminated and all Java applets have Java-free replacements. For more information, refer to the Workforce Central v8.0.11 release notes.

### Client software and hardware requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
</table>
| **Operating system** | • Microsoft Windows 8 and 8.1 (64-bit) – Desktop Mode, Home, and Professional editions  
• Microsoft Windows 7 (32- and 64-bit) – Home, Professional, Ultimate, and Enterprise editions  
• Microsoft Windows Server 2012 (64-bit)  
• Microsoft Windows Server 2012 R2 (64-bit)  
• Mac OS X 10.9 10.10 |
| **Browser support** | • Microsoft Internet Explorer 11 (32- and 64-bit)  
• Microsoft Internet Explorer 10 (32- and 64-bit)  
• Microsoft Internet Explorer 9 (32- and 64-bit)  
• Mozilla Firefox Next (32)  
• Chrome (32- and 64-bit)  
• Apple Safari 7 or later (OS-X 10.9 and 10.10)  
Note that Compatibility Mode must be turned off with Internet Explorer. |
| **JRE support**     | Oracle JRE 8 and Java plug-in version 1.8 — ships with Workforce Central 8.0 and is downloaded the first time Workforce Central is accessed |
| **Processor**       | **Navigator Framework**: Recommended: 2.0 GHz or better, Intel Pentium 4 or AMD equivalent  
**HTML Client**: Recommended: 1.0 GHz or better, Intel Pentium III or AMD equivalent |
## Server system requirements

Workforce Central consists of application server, web server, and notification server components. These components can be installed on the same machine or different components can be installed on separate machines.

Actual hardware requirements for the Workforce Central applications are based on many variables, including the number of employees and users at a company. For Kronos recommendations specific to your environment, refer to your Hardware Recommendations Report and your Kronos Representative.

System requirements for the Workforce Central application server, web server, and notification server are outlined in the following table.

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Memory</strong></td>
<td>Minimum supported: 2 GB</td>
</tr>
<tr>
<td></td>
<td>Recommended: 4 GB</td>
</tr>
<tr>
<td></td>
<td>SUSE Linux: 12 GB RAM, 8 GB heap size</td>
</tr>
<tr>
<td></td>
<td>Minimum supported:</td>
</tr>
<tr>
<td></td>
<td>• 512 MB (Windows XP)</td>
</tr>
<tr>
<td></td>
<td>• 1 GB MG (Windows Vista, Windows 7)</td>
</tr>
<tr>
<td><strong>Hard disk space</strong></td>
<td>Minimum free disk space: 100 MB</td>
</tr>
<tr>
<td></td>
<td>Minimum free disk space: 50 MB</td>
</tr>
<tr>
<td><strong>Display resolution/Graphic memory</strong></td>
<td>Minimum: 1024 x 768</td>
</tr>
<tr>
<td></td>
<td>Minimum graphics memory: 128 MB (Flash Player hardware requirement)</td>
</tr>
<tr>
<td><strong>Adobe Acrobat Reader</strong></td>
<td>Adobe Acrobat Reader v6.0</td>
</tr>
<tr>
<td></td>
<td>For Mac OS, may need to be set up as default application.</td>
</tr>
<tr>
<td><strong>Network bandwidth</strong></td>
<td>• Fractional T1 or T1–T3 (recommended)</td>
</tr>
<tr>
<td><strong>Other requirements</strong></td>
<td>• Adobe Flash Player 11.1 or higher (required for navigator framework)</td>
</tr>
<tr>
<td></td>
<td>• CD-ROM reader (or access to one on the network)</td>
</tr>
<tr>
<td></td>
<td>• Network card</td>
</tr>
<tr>
<td></td>
<td>• Non-persistent (session) cookies enabled</td>
</tr>
<tr>
<td></td>
<td>• JavaScript enabled for Java Client</td>
</tr>
<tr>
<td></td>
<td>• Pop-up-blocking software configured for browser to show pop-up windows</td>
</tr>
</tbody>
</table>

1 Refer to Workforce Central Performance Best Practices Guidelines & Hints and Tips for recommendations about network speed for optimal performance.
**Note:** Kronos recommends that your system be updated to the latest service pack/patch level recommended by the operating system vendor.

## Workforce Central server requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>• Microsoft Windows Server 2012 (64-bit)</td>
</tr>
<tr>
<td></td>
<td>• Microsoft Windows Server 2012 R2 (64-bit)</td>
</tr>
<tr>
<td></td>
<td>• IBM AIX (pSeries) (64-bit) v7.1</td>
</tr>
<tr>
<td></td>
<td>• SUSE Linux Enterprise Server (SLES) v11</td>
</tr>
<tr>
<td>Application server</td>
<td>JBoss Java Enterprise App Program 6.3 (EAP 6.3) with JDK 1.8 Update 31</td>
</tr>
<tr>
<td></td>
<td>(installed by the Workforce Central installer)</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> .NET framework 3.5 sp 1 or 4.0 must be installed on the application server machine (required by Report Viewer). See “Prerequisites” on page 44 for more information.</td>
</tr>
<tr>
<td>Network protocol</td>
<td>• TCP/IP</td>
</tr>
<tr>
<td>Web server software (HTTP daemon)</td>
<td>• Microsoft IIS 8.0</td>
</tr>
<tr>
<td></td>
<td>• Microsoft IIS 8.5</td>
</tr>
<tr>
<td></td>
<td>• Apache 2.4.9³³</td>
</tr>
<tr>
<td>Notification server</td>
<td>Openfire server version 3.7.2</td>
</tr>
<tr>
<td>Server-side JRE support (bundled with JBoss)</td>
<td>• Microsoft Windows: Sun JDK 1.8 Update 31</td>
</tr>
<tr>
<td></td>
<td>• IBM AIX: JDK 1.8</td>
</tr>
</tbody>
</table>

1. Workforce Central automatically supports security and bug service packs specific to these operating systems. No new Workforce Central release is necessary to support these updates.
2. Server names must not include nonstandard characters, such as an underscore. If a server name contains a nonstandard character, Process Manager may fail.
3. Not supported by Workforce HR/Payroll. Streaming video on Kronos InTouch 1.1 not supported with Apache; IIS is required.
Prerequisites

Workforce Central 8.0 requires that the .NET framework 3.5 sp1 or 4.0 be installed on the application server before you install the suite.

Database system requirements

The Workforce Central software requires an Oracle or Microsoft SQL Server database. General requirements and considerations include the following:

- **Installation machine** — Oracle databases cannot be on the same machine as other Workforce Central components. Although you can install Workforce Central on the same machine as a SQL Server database, you should consider installing it on a separate machine, especially if the database is large.
- **Code pages** — Because Workforce Central v8.0 supports Unicode character encoding, multiple instances of most languages can coexist on a single database without regard to code page (such as Latin 1, Latin 2, or Latin 9).
- **Bidirectional character sets** — Workforce Central does not support bidirectional character sets, such as Hebrew and Arabic.
- **Multibyte character support** — All databases support multibyte characters for any character set outside of Latin 1, Latin 2, and Latin 9, including multibyte characters (such as Chinese, Japanese, and Korean).

Note: Kronos recommends that your system be updated to the latest service pack/patch level recommended by the RDBMS vendor.

### Database system requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system¹</td>
<td>All operating systems supported by the RDBMS vendor²</td>
</tr>
<tr>
<td>RDBMS</td>
<td>• SQL Server 2008 R2 (64-bit)</td>
</tr>
<tr>
<td></td>
<td>• SQL Server 2012 (64-bit)</td>
</tr>
<tr>
<td></td>
<td>• SQL Server 2014 (64-bit)</td>
</tr>
<tr>
<td></td>
<td>• Oracle 11g R2, Enterprise or Standard Editions³</td>
</tr>
<tr>
<td></td>
<td>• Oracle 12c, Enterprise or Standard Editions³</td>
</tr>
</tbody>
</table>
**System requirements**

### Disk space requirements

Many variables determine disk space requirements for the Workforce Central database server. Refer to your *Hardware Recommendations Report* and your Kronos Service Representative about ongoing space usage guidelines for your specific environment.

### Machine time

Workforce Central has the option of using the machine time on the database server to compute Time Stamp and other time-related values on the Workforce Timekeeper application server. When this option is enabled, you should make every effort to keep the time on the database server as accurate as possible.

After you install Workforce Central, you can access this option in the Clock Synchronization section of the Workforce Central System Settings as follows:

1. Select **Setup > System Configuration > System Settings**.
2. From the System Settings workspace, click the **Clock Synchronize** tab.

Note that making major changes to the time on the database server may cause unpredictable behavior in various parts of Workforce Central, especially if those changes are made just before, during, or after periods of heavy activity. For this reason, Kronos recommends that you make frequent, small adjustments to the date/time on your database server and not allow it to stray drastically from the true time.
When drastic changes are required and the Clock Synchronize option is enabled, Kronos recommends that you restart the clock synchronize daemon by selecting the **Threads** tab in the System Settings. This immediately resynchronizes the Workforce Timekeeper application server time-relative values to the time of the database server.

**Workforce Worksheet system requirements**

Workforce Worksheet enables you to dynamically retrieve a number of Workforce Central reports and Genies using Microsoft Excel.

Setting up an environment for Workforce Worksheet requires both client and server activities: You must install Workforce Worksheet on the applicable client machines and you must prepare the server so that Workforce Worksheet can connect to Workforce Central.

Before you install Workforce Worksheet, Microsoft Office Microsoft Office Excel 2010 (32- or 64-bit versions) or Microsoft Office Excel 2013 (32- or 64-bit versions) must be installed on the client machine.

**Note:** The 32-bit version of Excel can run on either 32- or 64-bit operating systems. The 64-bit version of Excel can only run on 64-bit operating systems.

The Workforce Worksheet installer checks for the following prerequisites before installing Workforce Worksheet. If any of these prerequisites are missing, the Workforce Worksheet installer installs the version appropriate for the version of Excel being used:

- Microsoft .NET Framework version 3.5 sp1. This is already installed if you have the Windows 7 operating system.
- 2007 Microsoft Office System Update: Redistributable Primary Interop Assemblies

For more information about Workforce Worksheet, refer to the *Workforce Worksheet Installation and Configuration Guide.*
Network requirements

Timekeeper components, such as the application server and the Background Processor, communicate with the database server over a local area network (LAN).

Your choice of network and connecting hardware can affect the performance of your Timekeeper system. The number of nodes on your network and the transfer throughput are some of the external factors that can affect performance. Each client must support Transmission Control Protocol/Internet Protocol (TCP/IP) as a transport protocol.

Before you install your Workforce Central system, do the following:

1. Check each application server and client workstation’s physical connection to the network.

2. Verify that each application server and client workstation supports TCP/IP. Do this by creating a remote login session to your host server with Telnet, or by using the ping command in Run window (Start > Run on Windows machines) to locate the host server by its IP address.

3. Connect to your database server using your RDBMS SQL Query tools to verify that each application server and client workstation can connect to the host server, using the RDBMS client software, if required.

Active Directory

Active Directory is a Microsoft service that has long been used in Windows networks. It runs on a separate server, sometimes described as a domain controller. It supports the NT authentication protocol (also known as NTLM) used by Workforce Central. Active Directory also supports LDAP.

The Workforce Central application server communicates with Active Directory using the Windows NTLM challenge/response protocol.
Authentication

Workforce Central supports the following authentication methods:

- **NT authentication**
- **LDAP authentication** — For more information, refer to the Workforce Central installation documentation.
- **Single Sign-On (SSO)** — The following methods of single sign-on are supported:
  - Computer Associates eTrust SiteMinder v6, service pack 3
  - Security Assertion Markup Language (SAML)

See the online help for more information.

- **Integrated Windows Authentication** — If your Workforce Central installation uses a Microsoft IIS web server, Integrated Windows Authentication is supported.

**Important**: Integrated Windows Authentication (IWA) mode requires an IIS configuration change that blocks access to clients that do not transmit Windows network login credentials. Because of this, certain products, such as Integration Manager and Device Manager, are unable to communicate with an IWA application server, and therefore unable to use the single sign-on feature.

If you plan to use Integrated Windows Authentication and you also use products such as Integration Manager or Device Manager, you must use a second, non-IWA web server to handle authentication for the incoming traffic for those products.

Some features, such as the Quick Timestamp applications, Worksheet, and the XML API require a user name and password to be entered but do not include an interface with IWA. These features, therefore, cannot take advantage of single sign-on.
Citrix MetaFrame support

Workforce Central v8.0 supports Citrix MetaFrame to improve client performance for customers who use non-Pentium or low-end Pentium client machines. Citrix MetaFrame support also enables diskless clients to access Timekeeper.

Support for Citrix browser-based UI

<table>
<thead>
<tr>
<th>MetaFrame Version</th>
<th>Operating System</th>
</tr>
</thead>
<tbody>
<tr>
<td>XP Presentation Server</td>
<td>Microsoft Windows XP</td>
</tr>
<tr>
<td></td>
<td>Microsoft Windows Server 2008</td>
</tr>
<tr>
<td></td>
<td>Microsoft Windows Server 2008 R2</td>
</tr>
</tbody>
</table>

Java 1.8 (Workforce Central 8.0 through 8.0.10)

Workforce Central v8.0 supports JBoss EAP 6.3 with JDK 1.8 Update 31 and Oracle JRE 1.8 Java plugin version 1.8 Update 31 or later.

- JBoss EAP 6.3 with JDK 1.8 Update 31 is deployed on the Workforce Central server as part of the standard installation. All Workforce Central Java components are compiled and built using the JDK 1.8. Earlier versions are not supported.

- The Java plug-in is for use on the client side in conjunction with applets deployed by Workforce Central. Earlier versions of the plug-in are not supported for Workforce Central v8.0.

The Java plug-in is provided with Workforce Central v8.0 as an executable file that is downloaded to the client when a Workforce Central applet is invoked. The use of the plug-in download is strictly associated with the Microsoft Internet Explorer browser. The Firefox browser does not download the plug-in. The Firefox plug-in must be downloaded and installed separately.

**Note:** With Workforce Central v8.0.11 and higher, the JRE plugin is not required.
Database options

Workforce Central requires a SQL Server or Oracle database. The following sections describe:

- "Oracle considerations" on page 50
- "SQL Server considerations" on page 53

For information about the Database Manager utility, which is used to create or upgrade the database objects (tables, keys, stored procedures, triggers, and so on), see “Database Manager” on page 26.

Oracle considerations

In addition to Oracle 11g R2 databases, Workforce Central v8.0 supports Oracle 12c databases. The JDBC driver for Oracle supports both Oracle 11gR2 and 12c. Oracle 10g R1 or earlier databases are not supported for Workforce Central v8.0.

You should be proficient with creating and managing an Oracle instance, creating and updating tablespaces, and managing database accounts. Consult an Oracle database administrator’s guide if you are unfamiliar with these functions.

Oracle initialization parameters

A key to ensuring optimal application performance with an Oracle platform is to minimize the amount of physical I/O required to process a query. With this in mind, Kronos has tested a number of parameter settings for optimal performance of an Oracle database with Workforce Central.

The recommended Oracle initialization parameters are included in the Workforce Central Performance Best Practices Guidelines & Hints and Tips book. The values identified should be set to assure optimal performance of Workforce Central. Other documented or undocumented Oracle initialization parameter settings that are not listed in the table should be left at the default setting.

Although Workforce Central will function without setting these values, there is no guarantee that performance will be optimal. These recommendations were based
on testing and resolution of customer escalation issues, and on internal customer and synthetic database testing.

**Using multiple schemas**

A *schema* is an Oracle database user that has the ability to create its own objects within a database. The Oracle RDBMS is designed for multiple schemas to exist within a single database. Each schema can own or maintain its own objects without knowledge of other schemas.

- In Workforce Central’s single schema model, a schema called `TKCSOWNER` owns all Workforce Timekeeper tables, but the application connects to the database as different user, `SUPRKRON`.
- In Workforce Central’s multi-schema model, a schema called `TKCSOWNER` owns all of the tables, *and* the application connects to the database as `TKCSOWNER` as well.

Most implementations of Workforce Central use the single schema model. However, if you need to host data for multiple customers or maintain multiple variations of your application data, multiple schemas can be created within one instance.

With multiple schemas, an Oracle database instance can contain multiple users, with each user having a distinct collection of tables, views, and other database objects. Tables with the same name can reside in the same database instance if different users own them. These distinct user IDs have default access to their own objects.

The data set of a given application installation resides completely within a given schema (set of objects owned by one user). Thus, application data sets can share the database instance, each in separate schemas. Because of this, the maintenance tasks of the Oracle database instance, such as table space allocation and backup/restore, can be done once and applied uniformly for all schemas. This reduces some of the costs associated with data management.

The use of multiple schemas is transparent to the main runtime components of the Workforce Central application code. The application components will connect to the correct schema indicated by the access rights of the database user ID used.
If you are using multiple schemas, you should consider the following:

- Plan for the number of schemas required in each database instance ahead of time and define a dedicated database owner for each schema.
- Manually create the database user IDs on the database before creating the Workforce Central schema.
- Each schema is independent of any other schemas defined in the same database instance and can be at different versions of Workforce Central if required.
- Install a separate Workforce Central instance for each schema. When you install Workforce Central, you must enter the user ID and password to access the applicable schema. This information is maintained in encrypted form in the configuration files of the Workforce Central instance. A Workforce Central instance cannot access the data in any schema other than the one defined in the instance’s configuration.
- After you create a Workforce Central instance for a specific schema, run Database Manager once for each schema to establish the tables and other database objects needed for the application instance.

**Note:** Database Manager does not recognize any schemas other than the one owned by the user ID used to log on to the database.

- Combining currently independent databases as schemas within a new single database instance is a manual process. You must create database user IDs as schema owners in the new target instance, export the contents of each current database, and import them into the schemas of the new database.
SQL Server considerations

SQL Server databases do not require the same level of performance tuning as Oracle systems. Generally, SQL Server for Workforce Central is installed with default settings.

Note about SQL Server 2014:

Microsoft has made changes to the Cardinality Estimator in SQL Server 2014 that cause it to recommend the wrong execution plan, which in some cases, can cause severe performance issues. Setting the compatibility level of the database to SQL Server 2012 will allow it to access the 2012 version of the Cardinality Estimator which will perform better with this application.

To verify or change the compatibility level:
1. Right-click the instance name in SQL Server Management Studio and select Properties.
2. Select Options.
3. In the drop-down box for the available compatibility levels, select SQL Server 2012.

You should, however, be proficient with creating a database, creating files, adding file groups, and managing logins. If you are unfamiliar with these functions, consult the SQL Server Books Online.

Before you set up the database, obtain a copy of the Hardware Recommendations Report from your Kronos Representative. This document provides important space usage guidelines for your specific environment.

Workforce Central v8.0 uses the Read Committed Snapshot Isolation (RCSI) RSCI feature of SQL Server 2005. RCSI implements an optimistic data locking strategy that prevents different operations from blocking each other. See the Workforce Central installation or upgrade documentation for instructions on enabling this feature.
Chapter 2  Workforce Timekeeper and other Labor and Scheduling products

Workforce Central installation requirements

Workforce Central can be installed in several different configurations:

- **Operating system** — Windows, AIX or Linux
- **Application server** — JBoss EAP 6.3 with JDK 1.8
- **Web server** — Apache or Microsoft IIS
- **Notification Server** — OpenFire server version 3.7.2

Operating system options

Workforce Central can be installed on Windows AIX, or Linux systems. If you use Workforce Central in a Linux or AIX environment, you must also install one Windows companion server for reports. For more information, refer to the following:

- **Windows systems** — Workforce Central Installation Guide or Workforce Central Upgrade Guide
- **AIX or Linux systems** — Workforce Central on UNIX/Linux Installation and Upgrade Guide.

Application server options

An application server is a software platform for developing and deploying multi-tier distributed enterprise applications. It centralizes application services such as web server functionality, business components, and access to back-end enterprise systems. It uses technologies such as caching and connection pooling to improve resource use and application performance.

Workforce Central v8.0 uses a JBoss EAP 6.3 application server. JBoss is an open source application server that implements the complete Java 2 Enterprise Edition (J2EE) stack, including Java Server Pages (JSP), servlets, and Enterprise JavaBeans (EJB).

The Workforce Central installation program installs JBoss.
Note: Workforce Central can also be installed and configured for other application servers. See your Kronos Representative for more information.

Web server options

Workforce Central requires web server software, in regular or secure (SSL) mode. The web server handles static pages so the application server does not have to waste cycles on them. All JavaScript files, style sheets, help HTML files, and applet JAR files are served by the web server.

The web server can also stream data back to clients more efficiently than the application server. This is because Java normally uses a blocking I/O model where each connection is serviced by a separate thread. If the client’s network connection is slow and/or if the page being downloaded is large, an application server thread will be occupied for a relatively long time. By sizing the buffers on the web server correctly, the application server can return the whole page to the web server as fast as possible, and the web server can then stream the data down to the slow client more efficiently.

The Workforce Central installation program allows you to select any of the following web servers:

- Apache with or without SSL
- Microsoft IIS with or without SSL (Windows only)

Apache web server

The Workforce Central installation program installs the Apache web server if it is selected during the installation procedure.

Although Workforce Central will also properly configure Apache to run under SSL, you must manually apply the appropriate key and certificate files. Each machine must have its own key and certificate files and you must copy the files into a directory on the server. The installation procedure requires that you enter the location of these files. See “SSL security considerations” on page 103 for more information.
Microsoft IIS web server (Windows Only)

Microsoft Internet Information Server (IIS) is a Windows application that consists of FTP, e-mail, web server, and news groups components. Workforce Central only uses the web server component.

If you use IIS, you must install it before you install Workforce Central, using the default settings.

**Important:** If you are using Workforce Central 8.0.11 or higher, the IIS website used by Workforce Central must **not** have WebDAV enabled. If you need to use WebDAV:

1. Create a separate website that has WebDAV enabled.
2. Disable WebDAV in the default website used by Workforce Central.

When you run the Workforce Central installation program, the installation program automatically sets the IIS settings required by Workforce Central:

- Read permission
- Scripts enabled
- Scripts folder present
- Anonymous access
- Mappings for .asp and .asa files

Note that

If you are using IIS with SSL, you must obtain the key and certificate files. Each machine must have its own key and certificate files and you must copy the files into a directory on the server. See “SSL security considerations” on page 103 for more information.
Configuration options

Workforce Central, along with application server, web server, and notification server software can be installed on the same machine or on separate machines. You can also create multiple instances of each server type on the same machine. You can install the suite products from a graphical user interface or from the command line.

For information about installing these configurations, refer to the Workforce Central Installation Guide or the Workforce Central Upgrade Guide.
Install Workforce Central products

You can install Workforce Central using a graphical user interface (GUI) installer or a command line interface (CLI) installer.

- The GUI installer guides you through each step in the installation process as described in the Workforce Central Installation Guide.

- With the CLI installer, you enter the applicable installation options into a text options file and then run the installation executable from a command window or in a script. The installation runs in silent mode and does not return any messages or log files.

You can install and uninstall Workforce Central products, service packs, and language packs as well as to run Express Configuration Manager and Database Manager with the command line interface.

For more information, see the Workforce Central Installation Guide or Workforce Central Upgrade Guide.

Both the GUI and CLI installers use the Workforce Central Suite installation kit to install the following products:

---

**Note:** Workforce HR/Payroll is installed from a different kit.

- **Workforce Central Suite applications** — The Workforce Central suite installation kit enables you to install the following products. You can install any of these products at the same time that you install Workforce Timekeeper, or you can install them at a later date. You cannot install any of these products without Workforce Timekeeper.

  - **Timekeeper** — Timekeeper manages labor resources in real time by collecting, processing, and storing time and attendance data. Specific capabilities enable users to define pay policies, maintain employee demographics, query for employee information, manage employee time, create and maintain schedules, and generate reports.

    Timekeeper is a prerequisite for all of the following Workforce Central products.
Install Workforce Central products

- **Scheduler** — An enhanced scheduling product used when staffing requirements vary depending on business demands. Scheduler is a prerequisite for Forecast Manager, Budgeting, and Task Management.

- **Forecast Manager** — A product typically used in retail environments when staffing requirements vary depending on business demand. For example, it can be used to identify the number of staff to meet the level of service required on a given day.

  Forecast Manager replaces Workforce Scheduler with Optimization and requires that Scheduler is installed on the same machine.

- **Budgeting** — A retail scheduling product that enables budget stakeholders to collaboratively develop and review the budget. It also generates a labor forecast in hours as well as dollars for a future fiscal period.

  Budgeting requires that Scheduler and Forecast Manager are installed on the same machine.

- **Task Management** — A retail scheduling product that provides the retail market with ability to create, distribute, and monitor strategic tasks across their stores.

- **Absence Management**, which consists of:

  - **Leave** — A time-off monitoring product that tracks the time that employees have taken off under company leave policies.

  - **Attendance** — An attendance-monitoring product that extracts Timekeeper attendance information for rules processing and generates the appropriate warnings and other attendance information for managers.

- **Activities** — A product, typically used in manufacturing environments, to collect data at all stages of the production process. It also provides real-time information to help supervisors manage people and resources, track progress, and resolve production issues as they occur.

- **Device Manager** — A product that enables the flow of data between Workforce Central applications and data collection devices. Device Manager replaces Data Collection Manager.

- **Integration Manager** — Integration Manager is a next-generation data integration tool that interfaces Workforce Central products with other...
business-critical applications. Integration Manager allows users to run and maintain interfaces from their Workforce Central web interface. Interface programmers can use the client-side Interface Designer to create and update data integration interfaces.

**Important**: All of these products except Device Manager require a separate license. The installation program lets you install these products without a license, but you cannot access them until you apply the license file.

- Although not part of the suite installation, the following additional products can be installed from the Workforce Central installation kit:
  - **Setup Data Manager** — Setup Data Manager allows you to manage setup data.
  - **Process Designer** — Process Designer is the visual process design tool used to modify preconfigured process templates that are included with Process Manager (which is part of Timekeeper).

    Although most Process Manager components are installed on the application server when you install Timekeeper, Process Designer is a client application and can be installed on client machines.

    Process Designer does not require a separate license. For more information, refer to the *Workforce Central Installation Guide* or *Workforce Central Upgrade Guide*.

  - **Interface Designer** — Interface Designer is a client application used to create custom interfaces for Integration Manager.

    Interface Designer does not require a separate license. For more information, refer to the *Workforce Central Installation Guide* or *Workforce Central Upgrade Guide*.
Reports

The reporting functionality of Workforce Central v8.0 is based on the Report Definition Language Client-side (RDLC).

**Note:** Workforce Central v8.0 integrates the Advanced Reporting and Standard Reporting used in v6.2 through a single HTML UI by leveraging RDLC 2010. The Advanced Reports that were only delivered through Microsoft SSRS are now available within a single reporting interface.

RDLC is included with Workforce Central v8.0. No additional software is required to use standard reporting.

Workforce HR/Payroll uses Crystal Reports as its reporting mechanism and does not use RDL functionality.
Language support

Workforce Central supports a number of different languages. Kronos provides a language pack that includes language files for Brazilian Portuguese, French (Canada and France), German, Spanish (Mexico), Dutch (Netherlands), Simplified Chinese, Traditional Chinese, Italian, Polish, and Korean. Other languages can also be accommodated, as described in the *Guide to Translating and Customizing Workforce Central*.

You must install Workforce Central in English first, install the language pack, and then apply the applicable language to the Workforce Central installation.

Some points to remember when using Workforce Central for non-English systems include the following:

- **Code pages** — Multiple languages can coexist on a single database without regard to code page (such as Latin 1, Latin 2, or Latin 9).

- **Bidirectional character sets** — Workforce Central does not support bidirectional character sets, such as Hebrew and Arabic.

- **Multibyte character support** — If you want to support any character set outside of Latin 1, Latin 2, and Latin 9, including multibyte characters (such as Chinese, Japanese, and Korean), you must use Oracle 10g Release 2. Multibyte character encoding is not supported with SQL Server or Oracle 10g Release 1.

- **Asian fonts** — Asian fonts must be installed on all client machines that connect to a Workforce Central server that uses Asian locale or currency. If Asian fonts are not installed, the Asian characters will be garbled. They may appear as rectangles, question marks, or otherwise unrecognizable characters.

Refer to the *Workforce Central Installation Guide* or *Workforce Central Installation Guide* for instructions on configuring a Workforce Central system for non-English languages.
Service packs

Kronos periodically provides service packs to update, fix, and enhance Kronos products between releases.

When you apply a service pack, Database Manager applies the corresponding service pack changes (including database scripts). Uninstalling a service pack restores the database to its pre-service pack state but does not remove service pack changes from Database Manager (including database scripts).

Some key points about service packs include the following:

• Service packs are cumulative. Each service pack includes all the fixes from every previous service pack release.

• If you are using multiple instances of Workforce Central, the service pack installation program automatically invokes Configuration Manager so you can select the instance to which to apply the service pack.
  – All instances that use the same database must use the same service pack. You must stop all instances before you install a service pack, regardless of whether the instances are on different machines or the same machine.
  – Instances that do not use the same database can use different service packs. For example, instance wfc can be running service pack 3 and instance 2 can be running service pack 1.

**Exception:** If there is only one instance (by definition, the wfc instance), the service pack is applied to that instance automatically without user interaction.

• Service packs typically include fixes and updates for all products in the Workforce Central suite. However, only the products that you currently have installed are upgraded when you apply a service pack.

**Exception:** Help files, which are available to all products and all instances, may be updated for products that are not installed. For example, if a service pack includes help file updates for Activities, then those help files are installed, even if you do not have Activities installed.

• If you add a product to an existing installation that contains a service pack, the installation program for the new product applies the service pack
automatically. For example, consider the following: You install Timekeeper and Scheduler and then apply service pack v8.0.1. A month later, you purchase Leave. When you install Leave, you can apply service pack v8.0.1 at the same time.

The same is true if you add a second instance. When you create the second instance, Configuration Manager lets you apply any service packs that are installed on the system. You do not need to apply them separately.

- If you install a service pack and then decide not to use it, you can roll it back or uninstall it. In either case, the product returns to the base v8.0 state. There are, however, differences between a rollback and an uninstall:
  - A *rollback* leaves the installed service pack in the \Kronos\deployments directory and an *uninstall* removes the service pack installation from the deployments directory.
  - With a *rollback*, you can remove a service pack from one instance and leave it on other instances. An *uninstall* removes the service pack from *all* instances. For example, if instance 5 and instance 7 have service pack 5 installed, the uninstall removes service pack 5 completely from those instances and reverts them to v8.0.0. It also removes service pack 5 from the system.

    If you do not want to remove a service pack from all instances, use Configuration Manager.

- The service pack directory structure exists at the same level as the release, custom, patch, etc., directories. However, it has an additional sublevel, the SPx level, where each SPx directory contains a specific service pack. The structure under the SPx level is identical to that under the release, custom, etc. directories. It consists of *_staging areas, each of which contains an app_server and web_server subdirectory.*
Load balancing

To accommodate large enterprise environments, Workforce Central can be scaled, or expanded, to handle increased usage or to provide fault tolerance. Generally, scaling can be categorized as:

- **Horizontal scaling** — Adding web server or application server machines
- **Vertical scaling** — Adding multiple instances of Workforce Central on the same machine

Because Workforce Central v8.0 supports 64-bit operating systems, vertical scaling is not supported. A single instance of Workforce Central can take advantage of the machine’s total memory capacity.

There may still be times when installing Workforce Central on multiple machines is appropriate, so horizontal scaling is still applicable in many environments. When a Workforce Central environment consists of some combination of multiple instances, web servers, and application servers, communication between users and the system must be distributed across all servers. Various load balancing solutions are available that distribute user requests evenly across these array of servers.

For more information about load balancing, refer to *Workforce Central Installation Topics*. 
Background Processor

The Background Processor (BGP) is a service that runs as part of the Workforce Central application server. It runs constantly, checking the database to keep employee totals up to date. This enables processes that require up-to-date totals, such as the reports process, to have accurate data whenever you want to run them.

Because the Background Processor is a service of Workforce Central, it is not installed separately. The Background Processor requires a fully functional application server and cannot be run independently of the Workforce Central application.

The Background Processor is managed through the Workforce Central system settings. Refer to the online help for more information about managing the Background Processor.
Dedicate machines to certain functions

Workforce Central supports several special-purpose server configurations. You can run dedicated servers for:

- Reports
- Device Manager
- Batch processing

For example, you might choose to disable reports and batch processing on your main application servers (to make them as responsive as possible to real-time HTTP requests), and run these services instead on one or more separate servers that do not receive HTTP requests.
You must install Workforce Timekeeper before you install Workforce HR/Payroll. This delivers the navigator user interface as well as the Workforce Central platform, which provides core functionality used by all products in the Workforce Central suite, including common database tables, the People Editor, and Process Manager. It also installs the notification server, which is used by alerts and notification functionality. For more information, refer to the Workforce Central Installation Guide.

When HR/Payroll is running in an environment with other Workforce Central products, the HR/Payroll system is considered the master. When events occur that might require Timekeeper data to change, HR/Payroll sends these data changes to Timekeeper APIs. For example, when a new employee is hired, HR/Payroll sends the employee’s demographics and other information to Timekeeper APIs, which cause the same person to also appear in the Timekeeper workspace.

This chapter provides information about Workforce HR/Payroll and contains the following sections:

- “Installation considerations” on page 70
- “Install HR/Payroll” on page 72
- “System requirements” on page 74
- “HR/Payroll DB Manager” on page 77
- “Data synchronization” on page 78
- “Synchronize data” on page 86
- “Multiple instances in a Workforce HR/Payroll environment” on page 88
Installation considerations

Requirements for an HR/Payroll - Timekeeper installation include the following:

- **Homogeneous servers** — Each server in your environment must be identical and run all of your Workforce Central applications. You cannot install HR/Payroll on one machine and Timekeeper on another, if both machines use the same database.

- **System requirements** — Combined HR/Payroll - Timekeeper installations require the following on each machine in your environment:
  - The operating system must be Windows Server 2012 or Windows Server 2012 R2
  - The web server must be Microsoft IIS.
  - The application server must be JBoss.
  - The Microsoft .NET framework 3.5 sp1 or 4.0 must be installed on each server.
  - The database must be SQL Server 2008 R2, SQL Server 2012, or SQL Server 2014.

- **High-availability database (SQL Server Always On)** — If you plan to use the SQL Server Always On feature with Workforce HR/Payroll, be aware of the following:
  - `DB_ID()` of the database must be the same on each node. To check `DB_ID`, run the following query on the target database:
    
    ```sql
    select DB_ID()
    ```
  - All of the SQL Server instances on each database node should be added as linked servers to each other.

  If you encounter a failover, see the System Maintenance Tasks chapter in the Workforce HR/Payroll System Administrator Guide.

- **Maintenance** — Maintenance affects all Kronos applications. When a service pack arrives from Kronos, it is applied to all Kronos servers.

- **Multiple machines** — If you install the HR/Payroll Web Server on multiple machines, you must also use network load balancing.
• **Multiple instances** — If you install multiple instances of Workforce HR/Payroll on more than one web/application server machine, every web/application server machine that connects to the same database must include all of the same products.
Install HR/Payroll

Before you install HR/Payroll, you must set up a database and then run the Workforce Central installer to install Workforce Timekeeper. You can install Workforce Timekeeper on the same machine as the database or on a separate machine.

The Workforce Central installer delivers the following components:

- Application server
- Web server
- Notification server

Although the installer lets you install these components on the same machine or on separate machines, you **must** install the web server, application server, and notification server on the same machine if you are adding HR/Payroll to the environment.

**Note:** Because HR/Payroll database queries are made directly from the web server (via .asp and COM/.NET components), separation of the web and application servers on machines that include HR/Payroll do not provide security benefits.

The Workforce HR/Payroll components are organized differently than the Workforce Central components:

- **Web and application server** — Provides the application logic and web browser user interface for the Workforce HR/Payroll administrative application and the Workforce Employee and Workforce Manager self-service application.

- **Payroll Engine and Database Server** — Processes all payroll-related functions and manages the Workforce HR/Payroll aspects of the database.

- **External Applicant web site** — When you install the web and application server, the installation program also installs the External Applicant web site. However, the Workforce HR/Payroll installer also enables you to install the External Applicant web site outside of your company’s firewall on a dedicated machine.
All of these components can be installed on the same machine ("single server" option) or the web and application server can be installed on one machine and the database server and payroll engine can be installed on another machine ("dual server" option).

When you add HR/Payroll to the Timekeeper installation, select one of the following options, depending on how you installed Timekeeper:

- **Single server** — If you installed the Timekeeper web and application server on the same machine as the Workforce Central database, select both the Web and Application Server check box and the Payroll Engine and Database Server check box. All components will be installed on the same machine.

- **Dual server** — If you installed the Workforce Central web and application server on one machine and the Workforce Central database on a another machine, install HR/Payroll with the "dual server" option:
  
  - First, install the payroll engine/database server on the same machine as the Workforce Central database server.
  
  - Then, install the HR/Payroll web/application server on the same machine as the Timekeeper web/application server.
# System requirements

## Workforce HR/Payroll client software requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
</table>
| **Operating system**| • Microsoft Windows 8 (64-bit)<sup>1</sup>  
                          • Microsoft Windows 8.1 (64-bit)<sup>1</sup>  
                          • Microsoft Windows 7 (32- and 64-bit)<sup>1</sup>  
                          • Microsoft Windows Server 2012 (64-bit)<sup>1</sup>  
                          • Microsoft Windows Server 2012 R2 (64-bit)<sup>1</sup> |
| **Browser support** | • Microsoft Internet Explorer 11 (32- and 64-bit)  
                          • Microsoft Internet Explorer 10 (32- and 64-bit)  
                          • Microsoft Internet Explorer 9 (32- and 64-bit)  
                          • Mozilla Firefox Next (32- bit)  
                          • Chrome (32- and 64-bit)  
                          Note that Compatibility Mode must be turned off with Internet Explorer. |
| **JRE support**     | Oracle JRE 8                                                                |
| **Processor**       | Recommended: 2.0 GHz or better, Intel Pentium III or AMD equivalent          |
| **Memory**          | Recommended: 2 GB  
                        Minimum supported: 1 GB                                                   |
| **Hard disk space** | Minimum free disk space: 100 MB                                            |
| **Display resolution** | Recommended: 1024 x 768                                                 |
| **Adobe Acrobat Reader** | Adobe Acrobat Reader v6.0                             |
| **Network bandwidth** | Fractional T1 or T1–T3 (recommended)                     |
| **Other requirements** | • CD-ROM reader (or access to one on the network)  
                          • Network card  
                          • Non-persistent (session) cookies enabled  
                          • JavaScript enabled and pop-up-blocking software configured to allow pop-ups for the web server that the application is running on. |

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1 Refer to *Workforce Central Performance Best Practices Guidelines & Hints and Tips* for recommendations about network speed for optimal performance.

## Workforce HR/Payroll web/application server requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
</table>
| **Operating system** | • Microsoft Windows Server 2012 (64-bit)  
                          • Microsoft Windows Server 2012 R2 (64-bit) |
### System requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application server</td>
<td>• JBoss EAP 6.3 (installed by the Workforce Central installer)</td>
</tr>
<tr>
<td>Network protocol</td>
<td>• TCP/IP</td>
</tr>
<tr>
<td>Web server software (HTTP daemon)</td>
<td>• Microsoft IIS 8.0</td>
</tr>
<tr>
<td></td>
<td>• Microsoft IIS 8.5 ³</td>
</tr>
<tr>
<td>The following must also be installed and running:</td>
<td>• World Wide Web Server</td>
</tr>
<tr>
<td></td>
<td>• SMTP Service</td>
</tr>
<tr>
<td>Server-side JRE support (bundled with JBoss installations)</td>
<td>• Microsoft Windows: Sun JDK 1.7 ⁴ (installed by the Workforce Central installer)</td>
</tr>
<tr>
<td>Server JRE</td>
<td>JRE 1.8</td>
</tr>
<tr>
<td>Network protocol</td>
<td>TCP/IP</td>
</tr>
<tr>
<td>Client browser</td>
<td>• Microsoft Internet Explorer 11 (32- and 64-bit)</td>
</tr>
<tr>
<td></td>
<td>• Microsoft Internet Explorer 10 (32- and 64-bit)</td>
</tr>
<tr>
<td></td>
<td>• Microsoft Internet Explorer 9 (32- and 64-bit)</td>
</tr>
<tr>
<td></td>
<td>• Mozilla Firefox Next (32-bit)</td>
</tr>
<tr>
<td></td>
<td>• Chrome (32- and 64-bit)</td>
</tr>
<tr>
<td>Note that Compatibility Mode must be turned off with Internet Explorer.</td>
<td></td>
</tr>
<tr>
<td>Database</td>
<td>• SQL Server 2008 R2 (64-bit) with compatibility level 90 or higher</td>
</tr>
<tr>
<td></td>
<td>• SQL Server 2012 (64-bit) with compatibility level 90 or higher</td>
</tr>
<tr>
<td></td>
<td>• SQL Server 2014 (64-bit)</td>
</tr>
<tr>
<td>Other software</td>
<td>• Adobe Acrobat Reader 4.0 or later</td>
</tr>
<tr>
<td></td>
<td>• Microsoft .NET Framework 3.5 sp1 or 4.0 ⁵ on every machine</td>
</tr>
</tbody>
</table>

1 Workforce HR/Payroll automatically supports security and bug service packs specific to these operating systems. No new Workforce HR/Payroll release is necessary to support these updates.

2 Server names must not include nonstandard characters, such as an underscore. If a server name contains a nonstandard character, Process Manager may fail.

3 The Workforce HR/Payroll installer automatically detects the Windows operating system version and applies the correct configuration scripts for IIS. IIS versions are explicitly paired to the Windows operating system versions.

4 Later versions in the 1.7.0 family can be used.

5 Workforce HR/Payroll automatically installs Microsoft .NET framework if it is not present on the machine. However, the Workforce HR/Payroll uninstall procedure does not remove .NET; if you want to remove it, you must do so manually.
Integrate Workforce HR/Payroll and Workforce Timekeeper

Integrating Workforce HR/Payroll v8.0 with the time and labor components of Workforce Central v8.0 (timekeeping, scheduling, activities) enables you to use Workforce HR/Payroll to maintain a subset of data that is common across applications. This common data includes:

• Employee personal information
• Labor management information
• Job and organization information (if organization mapping is enabled)
• Skills and certification information (if Workforce Scheduler is installed)

The integration of Workforce HR/Payroll and the time and labor components of Workforce Central consists of a combination of real-time application programming interfaces (APIs) and dedicated database views:

• A single database makes data easily accessible across applications.
• Real-time APIs handle the transfer of employee information from time and labor-specific pages in Workforce HR/Payroll to Workforce Central common database tables.

Various Workforce HR/Payroll application pages provide a data entry interface to Workforce Timekeeper. When you enter information on such pages, Workforce Central APIs automatically update the appropriate Workforce Timekeeper database tables. The information is then accessible to both applications.
HR/Payroll DB Manager

The Workforce HR/Payroll v8.0 installation program installs a utility—called HR/Payroll DB Manager—and creates a desktop icon for it. Many of the functions formerly supported in Solution Manager are now available in HR/Payroll DB Manager, specifically:

• **Resetting internal user accounts for a restored database** — Use Fix restored database in HR/Payroll DB Manager to reset internal user accounts. You must do this before the self-service applications can access the database.

• **Upgrading the database version** — Use HR/Payroll DB Manager to upgrade the database version, for example, upgrading from v6.2 to v8.0.

• **Changing an installation code** — If you purchase additional licenses for HR/Payroll or make other changes that require a new installation code, enter the new code using HR/Payroll DB Manager.

• **Viewing logs** — The Log Viewer lists all messages generated during tasks performed by HR/Payroll DB Manager. The viewer reports information (all messages) warning (warning and error messages only), and error messages, depending on the setting of the filter. You can bring up a dialog box with message details by clicking on the message in the list box.

• **Getting information on the DB Upgrade Process** — Use the DB Upgrade Process to determine the status of a database version upgrade.

• **Create a new database** — use HR/Payroll DB Manager to create an initialized database.
Data synchronization

This section contains the following topics:

- “Scope of data synchronization” on page 78
- “Terminology” on page 79
- “Employee personal data” on page 79
- “Licenses, profiles, roles, and primary accounts” on page 80
- “Jobs and organizations” on page 81
- “Skills and certifications” on page 83
- “Synchronization processor” on page 83
- “Queue assistants” on page 84

Scope of data synchronization

When Workforce HR/Payroll is integrated with the time and labor components of Workforce Central, the following data can be managed using Workforce HR/Payroll:

- A subset of employee personal information (see “Employee personal data” on page 79)
- License, profile, role, and primary account information (see “Licenses, profiles, roles, and primary accounts” on page 80)
- Job and organization information, if organization mapping is enabled (see “Jobs and organizations” on page 81)
- Skills and certification information, if Workforce Scheduler is installed (see “Skills and certifications” on page 83)

Workforce HR/Payroll automatically updates the appropriate time and labor database tables using Workforce Central APIs.
Data synchronization

Terminology

Even though the same or similar concepts exist across Workforce Central products, some of the terminology varies between the products. The following table correlates the key integration-related terminology.

<table>
<thead>
<tr>
<th>Workforce HR/Payroll Term</th>
<th>Time and Labor Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>employee position</td>
<td>job assignment</td>
</tr>
<tr>
<td>position</td>
<td>job in an organizational map</td>
</tr>
<tr>
<td>organization type</td>
<td>location type</td>
</tr>
<tr>
<td>organization code</td>
<td>node in an organizational map</td>
</tr>
<tr>
<td>employee skill</td>
<td>person skill</td>
</tr>
<tr>
<td>skill code</td>
<td>skill</td>
</tr>
<tr>
<td>skill start date</td>
<td>skill effective date</td>
</tr>
<tr>
<td>employee event of type certification</td>
<td>certification</td>
</tr>
<tr>
<td>certification event date</td>
<td>certification grant date</td>
</tr>
<tr>
<td>compensation code</td>
<td>pay code</td>
</tr>
<tr>
<td>attendance plan code</td>
<td>accrual code</td>
</tr>
</tbody>
</table>

Employee personal data

In an integrated system, Workforce HR/Payroll stores the following basic employee personal information in Workforce Central platform database tables:

- Employee ID
- Telephone Number
- First Name
- Address Type
- Middle Initial
- Street
- Last Name
- City
- Nickname
- State
- Hire Date
- Postal Code
- Base Hourly Wage
- Country
Licenses, profiles, roles, and primary accounts

In an integrated system, Workforce HR/Payroll stores the following license, profile, role, and primary account data in time and labor database tables:

<table>
<thead>
<tr>
<th>License Types</th>
<th>Pay Codes Profile (Manager Role)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pay Rule</td>
<td>Work Rule Profile (Manager Role)</td>
</tr>
<tr>
<td>Wage Profile</td>
<td>Reports Profile (Manager Role)</td>
</tr>
<tr>
<td>Worker Type</td>
<td>Organizational Group (Manager Role, if job and organization mapping is enabled)</td>
</tr>
<tr>
<td>Device Group</td>
<td>Job Transfer Set (Manager Role, if job and organization mapping is enabled)</td>
</tr>
<tr>
<td>Accrual Profile</td>
<td>Schedule Group Profile</td>
</tr>
<tr>
<td>Schedule Group</td>
<td>Shift Template Profile</td>
</tr>
<tr>
<td>Schedule Rule Set</td>
<td>Pattern Template Profile</td>
</tr>
</tbody>
</table>

Note:
- In Workforce HR/Payroll, the Hours Per Week value on the Human Resources > Employee Information > Pay Status page maps to the Employee Hours value on the Leave Management time and labor page.
- In Workforce HR/Payroll, the Hours Per Year value divided by 52 on the Setup > HR/Payroll > HR/Payroll Setup > Position Management > Position page maps to the Full-Time Hours value on the Leave Management time and labor page.
Data synchronization

Activity Profile  Availability Profile
(if Workforce Activities is installed) (if Workforce Scheduler is installed)

Default Activity  Time Entry Method (Employee Role)
(if Workforce Activities is installed)

Idle Time  Labor Level Transfer Set (Employee Role)
(using if Workforce Activities is installed)

Meal (if Workforce Activities is  Pay Codes Profile (Employee Role)
installed)

Default Team  Work Rule Profile (Employee Role)
(using if Workforce Activities is installed)

Login Profile  Job Transfer Set (Employee Role, if job and
(if Workforce Activities is installed) organization mapping is enabled)

Function Access Profile  Primary Account

Display Profile  Schedule Job List Seniority Dates
(Schedule if job and organization mapping is enabled
and Workforce Scheduler is installed)

Employee Group (Manager Role)  Pay Codes Profile (Manager Role)

Labor Level Transfer Set (Manager  Notification Profile
Role)  Approval Set

**Jobs and organizations**

When Workforce HR/Payroll is integrated with the time and labor components of
Workforce Central, you can construct an organization tree in Workforce HR/
Payroll and share it with Workforce Central. This enables you to maintain job and
organization information in one place.

You can also specify that Workforce Central use its own organizational maps. In
this case, organizational data is not shared between Workforce HR/Payroll and
Workforce Central.
The following Workforce HR/Payroll system settings govern job/organization mapping:

• Workforce Timekeeper Organization Tree
• Workforce Timekeeper Job Labor Level

Sharing an organization tree with Workforce Central is optional; you can set up an integrated system without enabling this feature.

**Note:** Because all employees must be assigned to Workforce HR/Payroll positions, if you enable job and organization mapping, the system assigns all employees to jobs in the time and labor organizational map. Conversely, if you do not enable job and organization mapping, the system does not assign any employees to jobs in the time and labor organizational map. Currently, there is no way to assign some employees but not others to jobs in the time and labor organizational map.

If job and organization mapping is enabled, Workforce HR/Payroll stores the following job and organization data in time and labor database tables:

**Job Information**
- Job Name
- Job Description
- Job Code
- Job Title
- Labor Level Entry Name
- Labor Level Entry Description
- Job Status
- Sort Order

**Organization Information**
- Change Date
- Location Number
- Parent Location Number
- Location Type
- Location Name
- Start Effective Date
- End Effective Date
- Description
- Labor Level Entry
Skills and certifications

If Workforce Scheduler is installed and integrated with Workforce HR/Payroll and Workforce Central, you can maintain skill codes, event codes of type Certification, and employee skill and certification assignments using Workforce HR/Payroll. This information is stored in time and labor database tables.

Maintaining skill and certification information involves two separate tasks: you must first populate the skill code table with skill codes and the event code table with events of type Certification. You must then assign skills and certifications to the appropriate employees. When this is complete, both the codes and employee attributes are stored in time and labor database tables.

If Workforce Scheduler is installed, Workforce HR/Payroll stores the following skill and certification information in time and labor database tables:

<table>
<thead>
<tr>
<th>Skill Name</th>
<th>Certification Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill Effective Date</td>
<td>Certification Effective Date</td>
</tr>
<tr>
<td>Skill Expiration Date</td>
<td>Certification Expiration Date</td>
</tr>
<tr>
<td>Skill Status</td>
<td>Certification Number</td>
</tr>
<tr>
<td>Proficiency</td>
<td></td>
</tr>
</tbody>
</table>

Synchronization processor

A synchronization processor handles the transfer of information from Workforce HR/Payroll to time and labor database tables or Workforce Central platform database tables. When time and labor information is entered in Workforce HR/Payroll, the following occurs:

- If the information is current-dated, the update is immediately sent to the time and labor database tables. (Note that if the information is back-dated, the update is immediately sent to the time and labor tables with an effective date of the current day.)
- If the information is future-dated, and the time and labor tables can store the effective date, the update is immediately sent to the time and labor tables. The change becomes effective on the designated date.
• If the information is future-dated, but the time and labor tables cannot store the effective date, the update is placed in a queue and sent to the time and labor tables on its effective date.

Even though the synchronization processor runs when an item is added to the synchronization processor queue, it is recommended that the HRIS manager set up a scheduled job in SQL Enterprise Manager to start the processor early each morning to process requests that are to become effective that day. The SQL Enterprise Manager job must be set up to run the stored procedure `sp_WTK_StartSyncProcess`. The HRIS manager can use the event log on the database server to investigate synchronization processor errors.

**Synchronization processor system settings**

The following system settings determine how long entries stay in the synchronization processor queue.

• Number of days to Purge Successful Transaction
• Number of days to Purge Error Transaction

These settings enable items that require attention to remain in the queue longer than items that do not require attention. The synchronization processor periodically triggers a stored procedure to clean up the queue based on the current system parameter settings.

**Queue assistants**

Two queue assistants enable the HRIS manager to monitor the synchronization processor for errors:

• “System Queue Assistant” on page 85
• “Employee Queue Assistant” on page 85
System Queue Assistant

The System Queue Assistant provides a view of all items currently on the synchronization processor queue. The following information is shown for each item on the queue: item status, employee name and ID, the type of data to be updated, date and time queued, effective date, transaction date and time for items successfully sent, and an error description for items that could not be sent.

You can view details of individual items in the form of XML files and delete individual items from the queue.

In addition, you can place employee information for all employees in the queue to fully synchronize this information between Workforce HR/Workforce Payroll and Workforce Central.

To access the System Queue Assistant, select Setup > HR/Payroll System Configuration > Queue Assistant in the Workforce Central workspace.

Employee Queue Assistant

The Employee Queue Assistant shows items currently on the synchronization processor queue for a selected employee. The following information is shown for each item on the queue: item status, the type of data to be updated, date and time queued, effective date, transaction date and time for items successfully sent, and an error description for items that could not be sent.

You can view details of individual items in the form of XML files and delete individual items from the queue.

To access the Employee Queue Assistant, select the Human Resources tab and then select Employee Information > Suite Setup > Queue Assistant in the Workforce Central workspace.
Synchronize data

In an integrated Workforce Timekeeper - Workforce HR/Payroll environment, you must synchronize the data between the two systems when you install Workforce HR/Payroll v8.0 and Workforce Timekeeper v8.0 for the first time. You should be aware of the following implementation considerations:

• Synchronize new Workforce HR/Payroll and The Workforce HR/Payroll user name IMPORT and password are automatically created when Workforce HR/Payroll is installed. The APIs use this user name to move information between Workforce HR/Payroll and Workforce Timekeeper. If you change this user name, you must specify the new user name in the Labor Management API Login User Name system setting.

• Make comparable compensation/pay codes the same in both Workforce HR/Payroll and Workforce Timekeeper. For example, use the code “REG” (for regular pay) in both systems. Do not use “REG” in one system and “REGULAR” in the other system.

• Workforce HR/Payroll attendance plan codes must match Workforce Timekeeper accrual codes in order to successfully transfer accruals from Workforce HR/Payroll to Workforce Timekeeper.

• Assess the payroll GL account requirements of your accounting/payroll department. Set up labor levels so that they represent GL accounts.

• Determine how your payroll department captures and reports hours on pay stubs. For example, if an employee works 40 hours on Shift 2, the shift differential might be captured and reported as either “40 Regular and 40 Shift2” or “40 Regular 2.” If the payroll department expects “40 Regular and 40 Shift2,” set up the Workforce Timekeeper pay code distribution to accommodate this.

• Set up default labor management profiles initially, then modify the information for individual employees as necessary. This ensures that the employee position information is accessible in Workforce Timekeeper.

• Workforce HR/Payroll accepts full-time equivalency (FTE) data based on ratios but not percentages. Therefore, when entering FTE data in Workforce Timekeeper, use only the Ratio FTE option; do not use the Percentage FTE option.
• In Workforce Timekeeper, if you change the way unspecified labor level entries are represented in labor account strings from a dash to some other character, Workforce HR/Payroll does not display the labor account strings properly. Therefore, in Workforce Timekeeper, do not change the way unspecified labor level entries are represented; leave them as dashes.

• When you set up an organization tree to send to Workforce Timekeeper, make all organization types and codes unique. Workforce Timekeeper does not allow duplicate location types or codes in the same tree.
Multiple instances in a Workforce HR/Payroll environment

Workforce Central and Workforce HR/Payroll v8.0 allow you to install multiple instances of the application on the same machine. The Configuration Manager utility lets you create, modify, delete, or rebuild an instance.

Multiple instances of Workforce HR/Payroll can connect to the same database or to different databases.

- **Multiple databases** — The most common use of multiple instances with HR/Payroll is to connect each instance to a different database to enable separate environments for training, testing, and production.

- **Single database** — Although used less frequently than multiple databases, you can also configure multiple instances of Workforce HR/Payroll to connect to the same database. If you have more than one machine connected to the same database, however, you must create the same instances on all machines in your environment.
Workforce HR/Payroll uses Crystal Reports as its reporting mechanism and does not use RDLC.
You must license each Workforce Central product to enable it to support the functionality and capacities that you purchased with your system. The type of license(s) assigned to each user defines the products available to the user and the scope of responsibility that the user can perform.

In addition, the product license supports capacities or maximum number allowed for employees and managers.

This chapter contains the following sections:

- “Required licenses” on page 92
- “Types of licenses” on page 93
- “Licensing process” on page 95
- “Licensing Timekeeper” on page 97
- “Licensing Workforce HR/Payroll” on page 99
- “Suite license interaction” on page 100
## Required licenses

If you are installing Workforce Central products for the first time, you must acquire the applicable licenses from Kronos before you start the installation process.

If you are upgrading from v6.x or v7.0:

- New licenses are *not* required for your v6.x products. For example, if you are currently using Integration Manager v6.1, you do not need a new license to upgrade to Integration Manager v8.0.
- New licenses are required if you are adding a product (such as Scheduler) or changing the employee or user capacities that the system allows.

Workforce HR/Payroll requires that you enter the license serial number and installation code during the installation procedure. Before upgrading to v8.0, check your current installation for this information.

1. Log on to the administration application.
2. Select **System > System Settings**, and look down the list for **Installation Serial Number** and **Installation Code**.
3. Write down the installation code and installation serial number or copy them to a folder outside of the Kronos folder.
Types of licenses

The Workforce Central suite has several implementations to ensure that each product within the suite is properly licensed.

Workforce Central supports two main categories of licenses,

- **Product** — Allows you to purchase the rights for either a site or a number of people to access the overall functionality of one or more Workforce Central products, such as Timekeeper, Scheduler, HR/Payroll, or Activities.

- **Interactive** — Allows you to purchase the rights for individual users to access the Workforce Central suite and to use the features of the products. There are two types of interactive licenses:
  - Manager or Supervisor access license
  - Employee access license

Suite product licenses

Depending on the Workforce Central products that you purchase, you are granted one or more of the following employee-based product licenses:

- Timekeeper
- Accruals
- Scheduler
- Activities
- Integration Manager
- Device Manager
Suite interaction licenses

Suite interaction licenses control the ability of users to interact within the Workforce Central suite. There are two types of interaction licenses:

- **Workforce Employee** — The Workforce Employee license controls a user’s ability to use all employee self-service functions available. The employee self-service functions that are present depend on the products that have been purchased and for which employees they are licensed.

  For example, if you install both Workforce HR and Timekeeper, self-service functions include all employee roles functions in Workforce HR and all employee time entry and reporting functions in Timekeeper.

  An employee who has a Workforce Employee license must also be assigned a suite product license.

- **Workforce Manager** — The Workforce Manager license controls a user’s ability to access the Workforce Central suite and use the available manager functions. The functions that are available depend on the product licenses that have been installed.

  – For Timekeeper, Scheduler, Accruals, and Record Manager, an employee who has a Workforce Manager license is not required to have additional product licenses.

  – For Workforce HR/Payroll, employees must split their role license into two distinct licenses, one for Workforce Employee and the other for Workforce Managers.

Any user of the Workforce Central suite must have at least one of the above interaction licenses, but may have both. A person cannot log on to the Workforce Central suite without at least one of these licenses.
Licensing process

A license authorization number is required to generate a license file for your software. You should receive a license authorization number in an e-mail from Kronos when your licensed software is processed and completed.

After you install Workforce Central v8.0 products, you must copy your product licenses to the following folder on all Workforce Central machines in your environment:

\Kronos\wfc\licensing

If you later add a product, you must also copy the new license to this folder.

Note: If you are installing Timekeeper on a UNIX or Linux machine, you should generate the applicable licenses on the Windows companion server first and then copy the licenses from the Windows machine to the UNIX or Linux machine.

Upgrading license levels

Workforce Central licenses are incremental. This means that if you add to your license level to increase the number of employees licensed for a product, you only need to add the new license to the \Kronos\wfc\licensing folder.

An incremental license increments in the following circumstances:

- Any incremental license for the same product as long as the version within the license files are the same.
- An existing feature license for the same product as long as the version within the license files are the same.

Verifying license information

After you generate license files and install a Workforce Central application, you can verify the license information in the following way:

1. Log on to the Workforce Central system by entering the following in a browser:

   http://ServerName/wfc/navigator/logon

   where ServerName is the name of your web server.
2. Log on to Workforce Central.

3. Select **Setup**, and then select **System Information** from the System Configuration box.

4. Click the **Licenses** tab. The following is an example listing of products and licensing information you might see:

<table>
<thead>
<tr>
<th>SYSTEM INFORMATION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Last Refreshed: April 9, 2015 1:02 PM</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>License</th>
<th>Limit</th>
<th>In Use</th>
<th>Available</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workforce Manager</td>
<td>100000</td>
<td>42</td>
<td>99550</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce Employee</td>
<td>100000</td>
<td>229</td>
<td>99714</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce HR Self-Service</td>
<td>5000</td>
<td>202</td>
<td>728</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce HR Administrator</td>
<td>100</td>
<td>1</td>
<td>99</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce Timekeeper</td>
<td>100000</td>
<td>259</td>
<td>99741</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce Accruals</td>
<td>100000</td>
<td>299</td>
<td>99741</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce Activities</td>
<td>100000</td>
<td>3</td>
<td>99997</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce Scheduler</td>
<td>100000</td>
<td>1</td>
<td>99999</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce Attendance</td>
<td>100000</td>
<td>0</td>
<td>100000</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce Leave</td>
<td>100000</td>
<td>0</td>
<td>100000</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce HR</td>
<td>5000</td>
<td>267</td>
<td>4743</td>
<td>6.0</td>
</tr>
<tr>
<td>Workforce Record Manager</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>6.0</td>
</tr>
</tbody>
</table>

The Limit values represent the employee and manager capacities for each product and are controlled by the product’s license file that you generated. These values should match the maximum number of employee licenses that you purchased.

**Contact information for licensing problems**

If you have problems with the licensing instructions, contact Kronos by e-mail at support@kronos.com, or call your local Kronos office or Kronos authorized dealer. Specify that you are having trouble generating your licenses from the Kronos Licensing web page.
Licensing Timekeeper

The Timekeeper v8.0 installation programs do not deliver a product license. Although you can complete the installation process and start configuring your system without a license, you cannot enter people records into your system. Therefore, you should obtain your license files early in the installation process.

Note: If you install Timekeeper as a prerequisite for HR/Payroll and are not planning on using Timekeeper functionality, you do not need additional Timekeeper licenses.

The Timekeeper licensing functionality uses plug-ins, the database, properties and FlexLM software to implement the validation and assignment of licenses. Each product or product area may also choose to provide additional enforcement criteria for its license type.

The basic license handling is performed by the Workforce Central platform. The platform interacts with the FlexLM manager to obtain the maximum allowed licenses by type and with the database to link the FlexLM entry to a type and model. The database is also used to count the number of licenses assigned for a seat-based model.

The following are special considerations for common Timekeeper configurations:

- **Multiple servers** — Every server in your environment must include all license files in the `Kronos\wfc\licensing` directory. If you install Timekeeper on more than one server, you must manually copy all of the license files to each application and web server.

- **Upgrading** — When you upgrade to v8.0 by uninstalling the earlier version of Workforce Timekeeper, all licensing directories are removed. Therefore, you must copy all licensing files to a temporary folder before you upgrade. When the upgrade is complete, copy all licensing files to the `\Kronos\wfc\licensing` folder.

Earlier versions of Workforce Central products may have placed licenses in the following folder:

`\Kronos\wfc\applications\xxx\licensing`

where `xxx` is the 3-character abbreviation for the application.
With Workforce Central v8.0, these individual application licensing folders have been eliminated and you must manually move all licensing files to \\Kronos\wfc\licensing.

- **UNIX/Linux installations** — If you are installing Workforce Central on a UNIX/Linux machine, log on to the UNIX/Linux server and copy the license file or files that you created for the Windows companion server to the UNIX/Linux server using FTP:

  cd /usr/kronos/wfc/licensing
  put filename.lic

Repeat this for each license file.
Licensing Workforce HR/Payroll

You will receive the license authorization information in an e-mail after Kronos ships your order. The e-mail includes a serial number and an installation code. The Workforce HR/Payroll installation program requires you to enter this information before you can install the product.

Unlike Timekeeper, Workforce HR/Payroll does not use the FlexLM software to implement the validation and assignment of licenses.

When you install Workforce HR/Payroll, however, a license called hrdefault.lic is delivered to the Kronos\wfc\licensing folder. This platform license is not an interactive license and is not sent to Timekeeper or the platform as part of an employee request, but it must be present in the Kronos\wfc\licensing folder in the platform in order for an employee to be added to the platform.


Suite license interaction

Manager and employee licenses are shared across the suite. This means that if a person is a manager in Workforce HR/Payroll, this person must have a Timekeeper manager license as well. An employee in Timekeeper must also have an employee interactive Timekeeper license.

Licenses can be accessed either explicitly or implicitly:

- Explicit selection of a license is when a user navigates to the Profile control and selects the License check box.
- Implicit selection of a license means that an action in Workforce HR/Payroll causes a suite-wide license to be turned on or off for a particular employee. As the following table shows, Workforce HR/Payroll does not implicitly set licenses if Workforce HR/Payroll employee self-service is not installed.

Employee and manager licenses are interactive licenses. If Workforce HR/Payroll does not have an interactive user component (employee self-service), it should not set license information implicitly.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Manager License</th>
<th></th>
<th>Employee License</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Implicit</td>
<td>Explicit</td>
<td>Implicit</td>
<td>Explicit</td>
</tr>
<tr>
<td>Workforce HR/Payroll and Workforce Timekeeper</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Employee self service not installed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Employee self service installed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Additional points to consider include the following:

- Actions that implicitly turn on or off an employee license include the following:
  - When you hire an employee, an employee license is assigned to the employee.
  - When you terminate an employee, the employee license assignment is removed.

- Actions that implicitly turn on or off a manager license include the following:
  - Assigning employee A to report to employee B causes employee B’s manager license to be activated (if it is not already activated).
  - Removing all employees who report to an employee with a manager license removes the employee’s manager license (unless the license has been explicitly turned on). This can happen when a single employee’s supervisor is changed or during a Mass Supervisor Change function. This can also happen when a supervisor’s last employee is terminated or when the last employee now works for someone else (transfer, promotion, etc.).
  - When the “Change Supervisor” control is used to update a group of employees’ supervisor, the license information for each employee who should have the manager license turned on or off is updated.

- When Workforce HR/Payroll and Timekeeper are both installed, employee and manager license information is sent as a part of every employee synchronization request.

If Workforce HR/Payroll self-service is installed and a person is a manager in Workforce HR/Payroll self-service, this person must also have a manager license in Workforce Timekeeper. This is to maintain the manager license enforcement across the suite. However, if HR self-service is not installed, a person can have a manager license in Timekeeper and not be a supervisor in Workforce HR/Payroll.
Chapter 5

SSL security considerations

The default communication method that Workforce Central uses is HyperText Transport Protocol (HTTP). With HTTP, much of the data between users and the system is text-based and, therefore, easily readable. If you require greater security, you can configure your server to use HyperText Transport Protocol Secure (HTTPS), which uses Secure Sockets Layer (SSL) to encrypt the data.

Specific characteristics of each protocol include the following:

• **HTTP communication** — HTTP is the primary communication protocol of the Web. It transmits data unencrypted. Security-sensitive data such as user name and password are transmitted “in the clear” when using HTTP without SSL.

• **HTTPS communication** — HTTPS is simply the HTTP protocol secured with SSL. SSL provides server authentication (and optional client authentication), privacy, and data integrity. Public key cryptography and digital certificates are the basis for the security features of SSL. Typically, a different port (port 443 instead of port 80 for HTTP) is used by the web server to listen for HTTPS communication.

The complexity implementing SSL with Workforce Central depends on your specific Workforce Central configuration and requirements. For example, if you install Timekeeper in a typical environment, you only need to provide the key and certificate files; the Timekeeper installation program configures SSL automatically. If you install Timekeeper in a custom environment, the process is more manual.

This chapter provides background information and describes how to prepare for SSL before you install Workforce Central applications. The actual configuration instructions are included with specific application installation documentation.

• “General considerations” on page 105
• “SSL secured data paths” on page 106
• “Certificates, keys, and credential stores” on page 108
• “SSL and Workforce HR/Payroll” on page 111
General considerations

Regardless of the Workforce Central application that you are installing, you should consider the following before you implement an SSL environment:

- **Network performance** — SSL imposes a significant processing overhead on network communication. Depending on your particular security and scalability needs, you should evaluate the appropriate options, including the possible use of SSL hardware devices to offload Workforce Central servers.

- **Greater configuration complexity** — SSL configuration involves additional steps, including the generation and installation of certificates. These procedures are potentially error prone and, depending on certificate choices, may require installation of certificates on all web browsers used with Workforce Central. Evaluate all impacts carefully before undertaking the implementation of SSL security.

- **Multiple servers** — If you use multiple servers and choose to use SSL, you must use SSL for *all* the servers in your environment. Kronos does not support mixing SSL and non-SSL servers in your Workforce Central environment, for the following reasons:
  - Mixing secure and non-secure systems lowers the security of the combined systems to non-secured status. For example, if two servers are configured to use the same database (and thus have the same set of users), any password compromise resulting from the use of the non-secure system would allow access when using the SSL-protected system.
  - Attempting to configure SSL and non-SSL servers in a multi-server environment is complex and may be difficult to manage.
SSL secured data paths

The following data communication paths within Workforce Central can be secured with SSL:

- **Web browser to web server** — This is the most commonly used communication path. SSL is supported by all web browsers supported with Workforce Central v8.0, for typical and custom installations:
  - **Typical installation** — The Timekeeper installation program automatically configures Apache or Microsoft IIS with JBoss.
  - **Custom installation** — Apache, Microsoft IIS, and IBM HTTP Web Server require manual configuration for SSL when used with preinstalled JBoss application servers.

Web browsers need to have or obtain trusted certificates to properly authenticate the web server. Web browsers are preconfigured with root certificates, which can be used check the identity of any web server that is secured with SSL certificates issued by those same roots. Well known Certificate Authorities (CA) include Verisign, Equifax, Thawte, and others.

- **Workforce Central clients to web server or application server** — Workforce Central components can use SSL to protect communications with the server.

- **Between application servers** — Application servers can also contact other application servers using SSL for tasks such as executing events or running reports. Workforce Central v8.0 supports SSL implementations for JBoss applications servers. Refer to the Timekeeper installation documentation for instructions on configuring SSL interprocess communication for JBoss.

- **Workforce Central application server to LDAP directory server** — SSL-secured Lightweight Directory Access Protocol (LDAP) communication is also supported with Workforce Central v8.0. With LDAP, a directory server runs on a host computer and various client programs that understand the protocol can log on to the server and look up entries, services, and devices. User logons that are configured to use an LDAP directory for authentication require password transmission between the Workforce Central server and the LDAP server. This communication can also be protected with SSL. The
LDAP over SSL combination is known as the LDAPS protocol, much as HTTP over SSL is HTTPS.

Refer to the *Workforce Central Installation Topics* document for instructions on configuring an LDAP directory server for use with JBoss.
Certificates, keys, and credential stores

Certificates can be obtained in a variety of ways. For testing, it is common to generate self-signed certificates. These certificates are easy to create and do not require an external certificate authority (CA), but in general, they are more difficult to administer than certificates signed by a CA.

When configuring a web server for SSL, an additional consideration is the option to use certificates that are signed by root certificates that are “pretrusted” by popular browsers. The root certificates are maintained by well known public CAs, and by virtue of being preinstalled in browsers, they eliminate the need for browser users to import new roots, or to be confronted by warnings about untrusted certificates.

Public CAs are typically accessible online. You generate certificate requests locally, then use a web site or e-mail to transmit the request to the CA for signing. You then copy the signed certificate to your target server and configure it for use.

Because the Workforce Central installation program requires that you identify the location of the SSL key and certificate files, you should obtain the required files before installing Workforce Central.

Methods to obtain these files before the installation include:

- **OpenSSL toolkit** — OpenSSL is an open source toolkit for SSL that includes tools for managing keys and certificates. You can download the OpenSSL toolkit from:

  http://www.openssl.org/related/binaries.html

  The CA.sh or CA.pl certificate authority scripts are an easier-to-use interface for using OpenSSL as a certificate authority.

- **Java Keytool** — The Java Keytool utility enables you to administer your own public/private key pairs and associated certificates for use with SSL. It also allows you to store the certificates of your communicating peers.

  Keytool stores the keys and certificates in a *keystore* or *truststore*:

  - **Keystores** — Used to store keys and certificates for Java-based SSL servers, like the JBoss application server. Keytool can generate keys and certificate requests and then import the signed certificate into the keystore.
Certificates, keys, and credential stores

- **Truststores** — Used by Java-based SSL clients such as application servers that initiate communication with other servers or LDAP directories. With basic forms of SSL, the client only needs to verify the certificate presented by the server. The truststore holds certificates used to perform this verification. Keytool is used to import the root certificates or server certificates of those servers that should be trusted.

If you cannot obtain the key and certificate files before you install Workforce Timekeeper, you can install blank (empty) files and replace them with the correct files after you install Workforce Timekeeper by using the OpenSSL toolkit or Keytool that are delivered by the Workforce Timekeeper installation program:

- OpenSSL toolkit is located in `\Kronos\apache\bin\openssl.exe`. The `CA.sh` or `CA.pl` certificate authority scripts, however, are not provided; you must get them from an OpenSSL distribution.
- Keytool is located `\Kronos\jre\bin\keytool.exe`.

**Certificates**

The following types of certificates can be used with Workforce Central:

- **Self-signed certificate** — Self-signed certificates are generally used in testing, because they are easier to generate, and security requirements are low. Both Java keytool and openssl can be used to generate self-signed certificates.

- **Certificate Authority signed certificate** — A Certificate Authority (CA) is generally used in production environments, for several reasons:
  - **Stronger security** — Unlike self-signed certificates, signing is controlled by a central authority that can require minimum standards of identification before issuing certificates.
  - **Hierarchical trust** — Hierarchical Trust provides scalability. When a large number of servers use certificates issued by the same Certificate Authority, only the single CA root certificate needs to be trusted by clients. This avoids the N*N certificates that would be configured (for N servers) with direct trust—not using a CA.
– **Public roots** — Certificates can be purchased from well known public Certificate Authorities. These certificates are trusted by browsers by default, so no trust configuration is necessary at the client.

**Note:** Do not use SSL certificate key lengths larger than 4096 bits. This is the maximum supported by Java Cryptography Extension 1.6, which is used by Workforce Central v8.0.

**Credential stores and keys**

Credential stores are repositories for user credentials to be used during the user authentication transaction. The keys found in SSL credential stores are usually RSA public or private keys, although it is possible to use other public key systems such as DSA.

When generating a certificate request, a matching public and private keypair must be generated. The private key is stored in the credential store and the public key is included in the certificate request. When the request is signed and then imported into the credential store, the public key in the signed request must match the private key already in the credential store. With Keytool, they must match or the import will fail, but even with Apache/OpenSSL key and certificate must match for SSL to function.
SSL and Workforce HR/Payroll

The Workforce HR/Payroll installation program does not require you to identify the SSL key and certificate files, which means that you can install Workforce HR/Payroll, acquire the key and certificate files, and then configure Workforce HR/Payroll for SSL.

Refer to the *Workforce HR/Payroll Installation Guide* or *Workforce HR/Payroll Upgrade Guide* for instructions on configuring Microsoft IIS for SSL for use with Workforce HR/Payroll.
Configure Workforce Central to use an SSL terminator

When an SSL connection is established, an SSL handshake occurs and SSL generates bulk encryption and decryption for each read-write. Because the performance cost of this SSL handshake can be significant, some companies install an SSL terminator device. An SSL terminator decrypts the SSL-encrypted data and then sends it to the web server in an unencrypted state, so that the web server does not have to perform decryption and the burden on its processor is relieved.

If you use an SSL terminator in your Workforce Central environment, you must configure Workforce Central to recognize the device properly:

1. Install Workforce Timekeeper in non-SSL mode as described in Installing Workforce Timekeeper.
2. When Workforce Timekeeper is up and running:
   a. Log on to Workforce Timekeeper.
   b. Select Setup > System Configuration > System Settings.
   c. From the System Settings workspace, click the Security tab, and edit the following settings:
      
      site.security.ssl.termination.on — Set to true.

      site.security.ssl.termination.host — Enter the name of the external SSL terminator device.

      site.security.ssl.termination.port — Enter the port number used by the SSL terminator device. If using the default SSL port 443, you can leave this setting blank.
   d. Click Save.
   e. From the System Settings workspace, select the Web & App Server tab. Because you installed Workforce Timekeeper in non-SSL mode, you must change the following settings from http to https:
      
      site.webserver.applet.communication.protocol — Change this setting to https.

      site.webserver.communication.protocol — Change this setting to https.
   f. Click Save.
3. Stop and restart Workforce Timekeeper.
4. After you make these changes and Workforce Timekeeper restarts, you will access Workforce Timekeeper from the SSL terminator device instead of from the web server. The logon URL is:

https://SSL_terminator/instance_name/navigator/logon

For example, if the SSL terminator name is XYZ11, you would enter:

https://XYZ11/wfc/navigator/logon
Before you start installing Workforce Central products, you should collect all the information that is required by the installation program. This chapter describes prerequisites and provides a number of preinstallation worksheets that can streamline the installation process. Specific topics include:

- “Preinstallation requirements” on page 116
- “Preinstallation worksheets” on page 119
Preinstallation requirements

The preinstallation requirements vary depending on whether you are installing or upgrading Workforce HR/Payroll only, Workforce Central only, or combined Workforce HR/Payroll and Workforce Central.

- “Workforce HR/Payroll” on page 117
- “Workforce Central” on page 116
- “Preinstallation worksheets” on page 119

Workforce Central

If you are installing Workforce Central, you must do the following before you start the Workforce Central installation program:

1. Ensure that the system requirements as outlined in Chapter 2, “Workforce Timekeeper and other Labor and Scheduling products,” on page 37 are met.

2. Understand the configuration that you will be setting up:
   - Operating system: Windows, AIX, or Linux
   - JBoss application server: installed with the Workforce Central installation program or preinstalled
   - Web server: Apache or Microsoft IIS
   - Secure Socket Layer (SSL)
   - Application server, web server, and notification server installed on the same machine or separate machines
   - Multiple instances

3. Back up your servers.

4. Make sure all users are logged off the servers that you plan to use.

5. Close any Windows or DOS applications.

6. Disable virus scan software to reduce installation time.
7. Verify that the SQL Server authentication is set up for mixed mode—SQL and Windows authentication—on all servers. Workforce Timekeeper logons—TKCSOWNER, SUPRKRON, and KRONREAD—all require SQL Server authentication:
   a. Select Start > Programs > Microsoft SQL Server > SQL Server Management Studio.
   b. In the Connect to Server dialog box, enter the appropriate information for your environment and click Connect.
   c. From Management Studio, right-click the server name, select Properties.
   d. Select Security from the left side of the Server Properties workspace, and then click SQL Server and Windows Authentication mode. Windows authentication is the default setting.

### Workforce HR/Payroll

If you are adding Workforce HR/Payroll to a Timekeeper installation, you must do the following before you start the Workforce HR/Payroll installation program:

1. Ensure that the system requirements as outlined in Chapter 3, “Workforce HR/Payroll,” on page 69 are met. Basically, you need at least one computer running Windows Server 2012 or Windows Server 2012 R2 with Microsoft IIS and Microsoft .NET installed. The database must be SQL Server 2008 R2, SQL Server 2012, or SQL Server 2014.

2. Understand the configuration that you will be setting up, which is usually one of the following:
   - One machine with the application and database installed
   - One machine with the application and another with the database

3. Back up your servers.
4. Make sure all users are logged off the servers that you plan to use.
5. Close any Windows or DOS applications.
6. Disable virus scan software to reduce installation time.
Preinstallation worksheets

Because the Workforce Central installation programs require you to enter specific information about the database and the application server, you should complete the worksheets in the printed copy of this book and refer to them during the installation procedure.

See your system administrator if you need help locating this information.

Caution: These worksheets include entries for system passwords. Keep these documents in a secure location.
## Workforce Central installation worksheet

<table>
<thead>
<tr>
<th>Dialog box</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General information</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destination</td>
<td>By default, Workforce Central is installed in the C directory, but you can change this.</td>
<td>Enter the directory name where Workforce Central will be installed:</td>
</tr>
</tbody>
</table>
| Products to install | The Workforce Central installation program allows you to install a number of Workforce Central products. Note, however, that you must have applicable license files to use these products. Select the licensed products you are installing from the list in the next column. | □ Timekeeper  
□ Scheduler  
□ Forecast Manager  
□ Budgeting  
□ Task Management  
□ Leave  
□ Attendance  
□ Activities  
□ Device Manager  
□ Integration Manager  
□ Process Designer  
□ Interface Designer |
| Setup type | During the installation, you must select whether you are installing:  
• Application server  
• Web server  
• Notification server  
You can install these components on the same machine or on separate machines. | □ Application server machine:  
______________________________  
□ Web server machine:  
______________________________  
□ Notification server machine:  
______________________________ |
The Workforce Central installation program will install:
- Apache – regular mode (HTTP)
- Apache – secure mode (HTTPS), which requires secure-mode certificate and key files

You can also use the following web server, but it is not installed by the Workforce Timekeeper installation program:
- Microsoft IIS – regular mode (HTTP)
- Microsoft IIS – secure mode (HTTPS)

You must install IIS (and SSL certificates if applicable) before you install Workforce Central.

<table>
<thead>
<tr>
<th>Dialog box</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
</table>
| Web server information | The Workforce Central installation program will install:
- Apache – regular mode (HTTP)
- Apache – secure mode (HTTPS), which requires secure-mode certificate and key files
You can also use the following web server, but it is not installed by the Workforce Timekeeper installation program:
- Microsoft IIS – regular mode (HTTP)
- Microsoft IIS – secure mode (HTTPS)
You must install IIS (and SSL certificates if applicable) before you install Workforce Central. | Select one of the following:
☐ Apache (HTTP)
☐ Apache (HTTPS)
If Apache-HTTPS, identify the location of the certificates and key files:
____________________________________
☐ IIS (HTTP)
☐ IIS (HTTPS)
If IIS-HTTPS, enter the fully qualified name or IP address of the application server:
____________________________________ |
| Application server name and AJP connector port | If you are installing a separate web server, you must enter the name of the application server machine and the AJP connector port (which is 8009 by default)
For a UNIX/Linux installation, this is the name of the Windows companion server. | Enter the application server machine name:
____________________________________
Enter the AJP connector port:
____________________________________ |
| Fully qualified domain names | As a best practice, Kronos recommends the use of fully qualified domain names. | Enter the fully qualified domain name of the application server:
____________________________________
Enter the fully qualified domain name of the web server:
____________________________________ |
| JBoss Administrator Console password | The JBoss Administrator console user name and password may be required by Kronos service personnel. | Enter the user name and password of the JBoss Admin console:
____________________________________ |
### Background Processor

The installation program enables you to select how you want the Background Processor threads enabled on the application server. You can select from:

- **Workforce Timekeeper application server only** — Disables the Background Processor threads. This machine will function *only* as an application server.
- **Workforce Timekeeper with BGP** — Installs Workforce Timekeeper application server with the Background Processor threads enabled. This machine will be used as a single server for *all* processes.

Select one of the following:
- Workforce Timekeeper application server only
- Workforce Timekeeper with BGP

### Database platform

Workforce Timekeeper supports Oracle and SQL Server databases. UNIX/Linux installations must use an Oracle database.

Select one of the following:
- **Oracle**
  - Multi-schema:
    - Yes
    - No
  - Select the version:
    - Oracle 11G Release 2
    - Oracle 12c
  - Oracle RAC Fast Connect Failover:
    - Yes
    - No
  - If yes, enter Oracle Notification Service configuration:

- **SQL Server**
  - SQL Server 2008 R2
  - SQL Server 2012
  - SQL Server 2014
  - SQL Server Always On:
    - Yes
    - No
### Preinstallation worksheets

<table>
<thead>
<tr>
<th>Dialog box</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database server name</td>
<td>Name of the server on which the database is located.</td>
<td>Enter the database server name:</td>
</tr>
<tr>
<td>Database port for JDBC</td>
<td>The default is 1433 for SQL Server and 1521 for Oracle. If you are using a different port number, enter it here.</td>
<td>Enter the port for JDBC connections:</td>
</tr>
<tr>
<td>Database server time zone</td>
<td>You must select the applicable time zone from a drop-down list in the installation program.</td>
<td>Enter the time zone:</td>
</tr>
</tbody>
</table>

**Passwords** *(Before you change XMLUSER, WBAUser, or 4500User, check the Workforce Central System Administrator Guide for more information)*

| SuperUser password          | The first time that you log on to Workforce Timekeeper as SuperUser, you *must* change the password. All machines in your environment should use the same passwords for the system accounts. For more information about changing these passwords, see the *Workforce Central Installation Guide*. | Enter the new password for SuperUser (online version):  
|                            |                                                                             | .................................................................................................................. |
|                            |                                                                             | Enter the new password for superuser (offline version):  
|                            |                                                                             | .................................................................................................................. |
| WFAUser                    | Kronos strongly recommends that you change all system passwords.            | Enter the new password:                                                       |
| ConnectUser                | Kronos strongly recommends that you change all system passwords.            | Enter the new password:                                                       |
| 4500User                   | Kronos strongly recommends that you change all system passwords.            | Enter the new password:                                                       |
| Import                     | Kronos strongly recommends that you change all system passwords.            | Enter the new password:                                                       |
| TELETIME                   | Kronos strongly recommends that you change all system passwords.            | Enter the new password:                                                       |
Kronos strongly recommends that you change all system passwords.

### XMLUSER
- **Description**: Kronos strongly recommends that you change all system passwords.
- **Information to enter**: Enter the new password:

### MobileTime
- **Description**: Kronos strongly recommends that you change all system passwords.
- **Information to enter**: Enter the new password:

### DCMSUser
- **Description**: Kronos strongly recommends that you change all system passwords.
- **Information to enter**: Enter the new password:

### TaskRunner
- **Description**: Kronos strongly recommends that you change all system passwords.
- **Information to enter**: Enter the new password:

### Totalizer
- **Description**: Kronos strongly recommends that you change all system passwords.
- **Information to enter**: Enter the new password:

### Oracle information

<table>
<thead>
<tr>
<th>Oracle SID</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle SID</td>
<td>Enter the Oracle system identifier (SID), which identifies the database instance that is associated with the Oracle executable.</td>
<td>Enter the Oracle SID:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Database schema logon</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
</table>
| User name and password of the owner of the database objects; for example, TKCSOWNER. | User name:  
| Password: | |

<table>
<thead>
<tr>
<th>Database logon</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
</table>
| The user name and password that your relational database requires; for example, SUPRKRONE | User name:  
| Password: | |
### SQL Server information

<table>
<thead>
<tr>
<th>Dialog box</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database name</td>
<td>The name of your database.</td>
<td>Enter your database name:</td>
</tr>
<tr>
<td>Database logon</td>
<td>The user name and password for SQL Server; for example, SUPRKRON.</td>
<td>User name:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Password:</td>
</tr>
</tbody>
</table>

### Languages

<table>
<thead>
<tr>
<th>Languages</th>
<th>Identify languages to install.</th>
<th>☐ Chinese (simplified)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>☐ Chinese (traditional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ French (Canada)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ French (France)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Spanish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ German</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Brazilian Portuguese</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Dutch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Italian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Korean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Polish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Other:</td>
</tr>
</tbody>
</table>

### Multiple Instances

If you are going to use multiple instances, identify the following:

<table>
<thead>
<tr>
<th>Instance name</th>
<th>Database name</th>
<th>Language</th>
<th>Products</th>
<th>Service pack</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance 1</td>
<td>wfc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instance 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instance 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Workforce HR/Payroll preinstallation worksheet

<table>
<thead>
<tr>
<th>Dialog box</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Workforce HR/Payroll information</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Type of installation | You can install any of the following:  
- Single server (web server, Payroll engine, and database on same machine)  
- Dual server (web server on one machine and Payroll engine and database on another machines)  
- External Applicant (Jobs web site outside a firewall) | Select one of the following:  
- Single server  
  Machine name: __________________________  
- Dual server  
  Web server name: __________________________  
  Database server name: __________________________  
- External applicant  
  Virtual directory name (default is Jobs): __________________________ |
| Licensing information | The product serial number and product installation code was sent to you in an e-mail message when your product was shipped. | Enter the following information:  
  Serial number: __________________________  
  Installation code: __________________________ |
| Communication protocol | Workforce HR/Payroll can run with either HTTP or HTTPS communication protocol. If you use HTTPS, you must also enter the fully qualified domain or IP address. | Select one of the following:  
- HTTP  
- HTTPS  
  If HTTPS, enter the domain: __________________________ |
### Required accounts and logon information

<table>
<thead>
<tr>
<th>Dialog box</th>
<th>Description</th>
<th>Information to enter</th>
</tr>
</thead>
</table>
| HRPayrollService    | A Windows domain user account called HRPayrollService is used when by the Workforce HR/Payroll installer. Instructions for setting up this account are included in the installation instructions. This is also the user account for authentication and authorization for COM+ and DCOM applications. | Enter the following information: User name: ___________________
| account             |                                                                                                                                             | Password: ___________________                                                                                                                                                                                   |
| HRMSSelfService     | You must enter a password for these two database accounts during the installation procedure. You must use the *same* password for both accounts whenever you install any Workforce HR/Payroll application including the Payroll engine/database server and web/application server. | Enter the following information: Password: ___________________                                                                                                                                                     |
| HRMSLogging         |                                                                                                                                                                                                           |                                                                                                                                                                                                               |
| accounts            |                                                                                                                                                                                                           |                                                                                                                                                                                                               |

### Database information

<table>
<thead>
<tr>
<th>Database name</th>
<th>Enter the database name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port number</td>
<td>The default port number for SQL Server is 1433, although you can use a different one.</td>
</tr>
</tbody>
</table>
| SQL Server system   | You must enter the SQL Server system administrator logon information during the installation procedure.                                                                                               | Enter the following information: User name: ___________________
| administrator logon  |                                                                                                                                                                                                           | Password: ___________________                                                                                                                                                                                     |
| information         |                                                                                                                                                                                                           |                                                                                                                                                                                                               |
|                     |                                                                                                                                                                                                           |                                                                                                                                                                                                               |