ClockWork Enterprise 5

Technical Overview rev 5.1
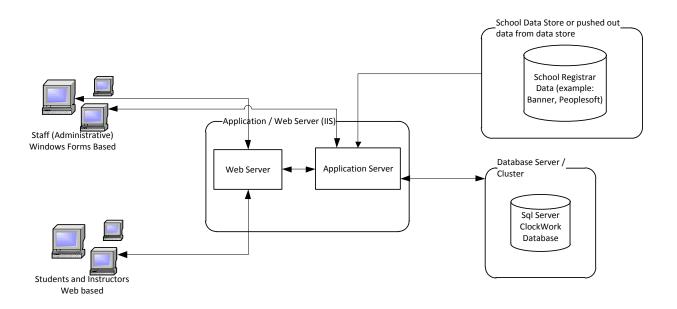
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Overview

The ClockWork software has a Service Oriented Architecture (SOA) with four main components:

- Microsoft Sql Server 2008 or higher, any edition
- ClockWork Server Application (based on Microsoft Windows Communication Foundation (WCF) web services)
- ClockWork Web Application (based on ASP.NET)
- ClockWork Client Application for Staff administrative access (based on .NET Windows forms)

Database Requirements

ClockWork Database Scheduler requires Microsoft Sql Server 2008 or higher. Sql Server 2008 R2 Express can be used if no Sql Server instance is already available – there are a few limitations but no cost attached. The limitations include a 10 GB per database limit, a single processor limit and a maximum usage of 1GB of ram for the buffer pool. Sql Server Express also requires database backups to be scripted manually (other editions have a built in graphical user interface for setting up backups). ClockWork includes the necessary scripts to configure backups on the express version and these are supported by TechnoPro. Sql Server 2008 Express is a viable option for departments with up to roughly 40 staff, but can also be easily upgraded at any time to a limitless version.

Database Storage Requirements

Hard drive space for data and projected growth requirements can vary significantly between schools, depending on what data is being collected and stored. A standard "rule of thumb" is to allow 250k per student per year. Note that only students who use the department(s) services will have accounts in the ClockWork database. So a department with 3000 students to start with and then 1000 additional new students per year would have 3000*250k = 750000k ~= 735 MB per year. This would translate to just over 7 GB of storage required over a 10 year period.

Actual space-requirement examples

# students	# appointments	Disk size	Space per student
3,650	65,000	50 MB	15 KB
3,282	39,363	27 MB	9 KB
4,441	51,000	32 MB	8 KB

There are facilities in ClockWork for data archiving. For example, students who haven't been active for at least 5 years would be removed from the database and archived, or appointments older than 5 years old, etc. Note that storing large files (such as documentation files or notetaking files) can result in increased space requirements. These numbers are for guidelines only. Actual space requirements vary by school and

depend on what parts of ClockWork are being actively used and the amount of usage in those areas.

Database backups can be compressed and will take considerably less space – a 40MB database backup will usually compress down to 6.5 MB using zip and 4.5 MB using 7zip.

Sql Server Authentication and Permissions

Sql Server has two possible authentication modes: Windows authentication and Sql Server authentication. Clockwork uses Sql Server authentication.

ClockWork Authentication and Permissions

ClockWork accounts can be created and placed into groups. Groups and or user accounts can be assigned permissions. Passwords are stored in the database hashed and then encrypted.

Data Encryption

ClockWork uses TripleDES 192 bit encryption for most of the data that is stored in the database. Data in transit from server to client is protected using SSL. The same SSL certificate can be shared by the web server application and the ClockWork server application.

ClockWork's authentication module is pluggable, so we are able to provide multiple methods of encryption/decryption if the need arises.

Security of Data In Transport

SSL is used to protect data in transit. Data in storage (in the database or in backups of the database) is protected using TripleDES encryption.

External Access

The best way to setup ClockWork is to only allow network access to the database server from local clients (behind the school's firewall system). For external/home access the ClockWork client software can be installed on the remote system and used through a VPN (Virtual Private Network) tunnel. This ensures that the database server is not open directly to the Internet, and that all communication over the Internet is encrypted using strong encryption.

Data Backups

Automatic backups of the database should run nightly. These are the responsibility of the school as the data is hosted locally on campus. Daily / weekly backup strategies and backup archiving somewhere other than the local server are recommended.

Audits

ClockWork logs all actions that are taken by a user, including failed logins, adding a student, modifying student data, adding an appointment, modifying / deleting an appointment, etc.

More Information

If you have a technical question about our software that was not answered here, please email us at clockworksupport@clockworks.ca, or call us at 416-848-0520.