Honeywell

Pro-Watch™ Software Suite
Release 4.4

Enterprise Configuration Guide

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Overview

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Overview

Planning an Enterprise System

1.1 Overview

Pro-Watch Enterprise system is key to synchronizing the databases of different regions running the same or different versions of Pro-Watch.

The new Enterprise will work in any environment, including:

- Cloud
- On-Premise
- Cloud/On-Premise Hybrid

There are significant differences between the old Enterprise platform and the new one introduced with Pro-Watch 4.4 release.

Here are some highlights.

1.1.1 Synchronization Methodology

Pro-Watch Enterprise uses a SQL feature called **Change Tracking**, which allows an application to pull only the changed data since the last pull. Benefits of using change tracking include reduced development time, no need for schema creation and modification, built-in tracking table cleanup, and reduced overhead.

1.1.2 Snapshots

For example, with the old Enterprise mode, the user had to take Snapshots of all tables whereas with the new 4.4 version **snapshots of all the tables are not mandatory**. In Enterprise 4.4, you can cherry-pick tables for Snapshots, if you need a Snapshot at all. See Snapshots, page 2-7.

1.1.3 Minimum Snychable Schema Set

In the old Enterprise, if the Regions were running different versions of Pro-Watch, the Enterprise would not run due to **different database schemas** with different tables and columns. The new Enterprise works even if the regions have different schemas. All the Enterprise server needs to have is a "**minimum synchable schema set.**"

1.2 Planning an Enterprise System

Pro-Watch Enterprise system designs vary from enterprise to enterprise, depending upon the enterprise's particular needs. However, the following points are useful for every Enterprise designer to consider:

Availability of bandwidth between Region servers and the Enterprise server. You will need to gauge the quantities of changes, transaction loads occurring at the Region, host updates, and business rules to handle data consolidated from multiple sites into one central repository.

- **Potential for duplicate logical records.** Pro-Watch, with a few exceptions, guarantees that no two primary keys in the database will be duplicated. A logical duplication occurs if two regions add, for example, two holiday records that both refer to New Year's Day. When you view data on the Enterprise, you see multiple New Year's holidays, each coming from different regions.

- **You also should avoid duplication of badgeholder records.** For example, two regions should not be able to enter the same badgeholder twice. While you may have multiple people with the same name, each enterprise should design a business rule to perform a unique identification of each person by a criterion other than the person's name. Another way to solve the problem would be to have a Human Resources system feed the badgeholders directly into the Enterprise server. Then, the Enterprise server transmits the master list to each of the Regions.

- **Timing database updates.** The Enterprise server serves as a central repository and a clearinghouse for badgeholder updates. In addition to collecting data from all the Regions, the Enterprise server sends out badgeholder updates to every Region to keep the badgeholder database synchronized throughout the enterprise. When implementing an Enterprise system, the administrator must keep the following issues in mind:

    - **Clearance Codes are specific to a Region.** When assigning Clearance Codes to a badgeholder, they cannot span multiple Regions. A badgeholder's credential may contain multiple Clearance Codes from multiple Regions, but an individual Clearance Code will be specific to the Region in which it was created.

    - **Credentials are automatically numbered.** Pro-Watch provides automatic numbering of credentials when they are created. Since credentials are created as unique to a Region, the potential exists for creating duplicate card numbers within the Enterprise. A Pro-Watch Enterprise system does not allow duplicate card numbers. The operator must be responsible for assigning access credential numbers that are based on some attribute of the data or from an external source, such as the embedded card number of a proximity access credential.

    - **Report capability.** The Enterprise server hardware should be adequate to handle report generation and to accept database updates from multiple Regions simultaneously. The enterprise should at least have more than one processor with 1 GB of RAM and a Redundant Array of Independent Disks (RAID) disk array with ample free space.

    - **Backup hardware.** An Enterprise server also requires a quick and high-density backup device. You can use a Microsoft Cluster server if additional availability is required to ensure that if one server fails, the cluster (and the Enterprise server) can continue to process updates and badgeholders.

- **Unique logical sites.** Pro-Watch systems are designed with a concept of logical sites. Each site contains a hardware tree, and it is assigned to a Pro-Watch workstation to perform panel communication. Each site identifier must be unique across the entire enterprise. When you add a site, Pro-Watch coordinates with the Enterprise server to ensure the site identifier is unique. After the identifier is assigned, the site's hardware tree is transmitted to the Enterprise server to supply the rest of the Regional server's hardware configuration.

- **When adding a new Regional server,** the operator can copy certain configurations from the Enterprise server, such as time-zones, holidays, hardware templates, and badgeholders, and copy them in the Regional server's database. This ensures that all regions start with a known good data load. From that point, the operator can modify the Regional server's database and publish the updates back to the Enterprise server.

- **Event monitoring and control.** In an Enterprise system, a single workstation monitor must be able to monitor more than one Regional server for alarm and transaction activity. For example, some regions may be staffed during business hours. But during the off hours, another Region will assume the monitoring responsibilities for the Regions to reduce costs.

- **To set up remote monitoring,** a Regional server adds routing groups and assigns them to any other Regional server. A Send All feature allows the Regional server to designate the sites that will receive events and the events that they will receive. This feature, therefore, can help the system administrator to reduce the unnecessary traffic to the other monitoring regions.

- **Authentication and security.** All of the SQL server agents run in the security context of the SQL server agent service on the machine. Pro-Watch uses integrated security for its authentication model. Therefore, the SQL server agents used on the regional and Enterprise servers must use an account that has context in the domain(s) in which the Regional servers and Enterprise server reside.

- **Different domain accounts** can be used on each Regional server; however, if they are in different domains they need to be members of the same Windows domain. This ensures that all domains know of each others' accounts via a trust relationship.

- Typically, the account used for the agent on the regions and the account used for the Pro-Watch service are the same. The account is set as dbo (database owner) for the Pro-Watch database and sysadmin on the SQL server. However, sysadmin is not required for running SQL server replication. The minimum requirement is that the used account must have access to the distribution and publication databases on the server and to the snapshot files. The account used to configure Enterprise on the enterprise machine must be a sysadmin account on that SQL server, since sysadmin privileges are required for configuring replication. The LocalSystem account is not usable for replication on either the enterprise or Regional servers.

- **SQL server encryption** is not yet supported for the Enterprise version of Pro-Watch. The TCP/IP port used for communication is the one defined for the SQL server TCP/IP library that is used. The default TCP/IP library is 1433.
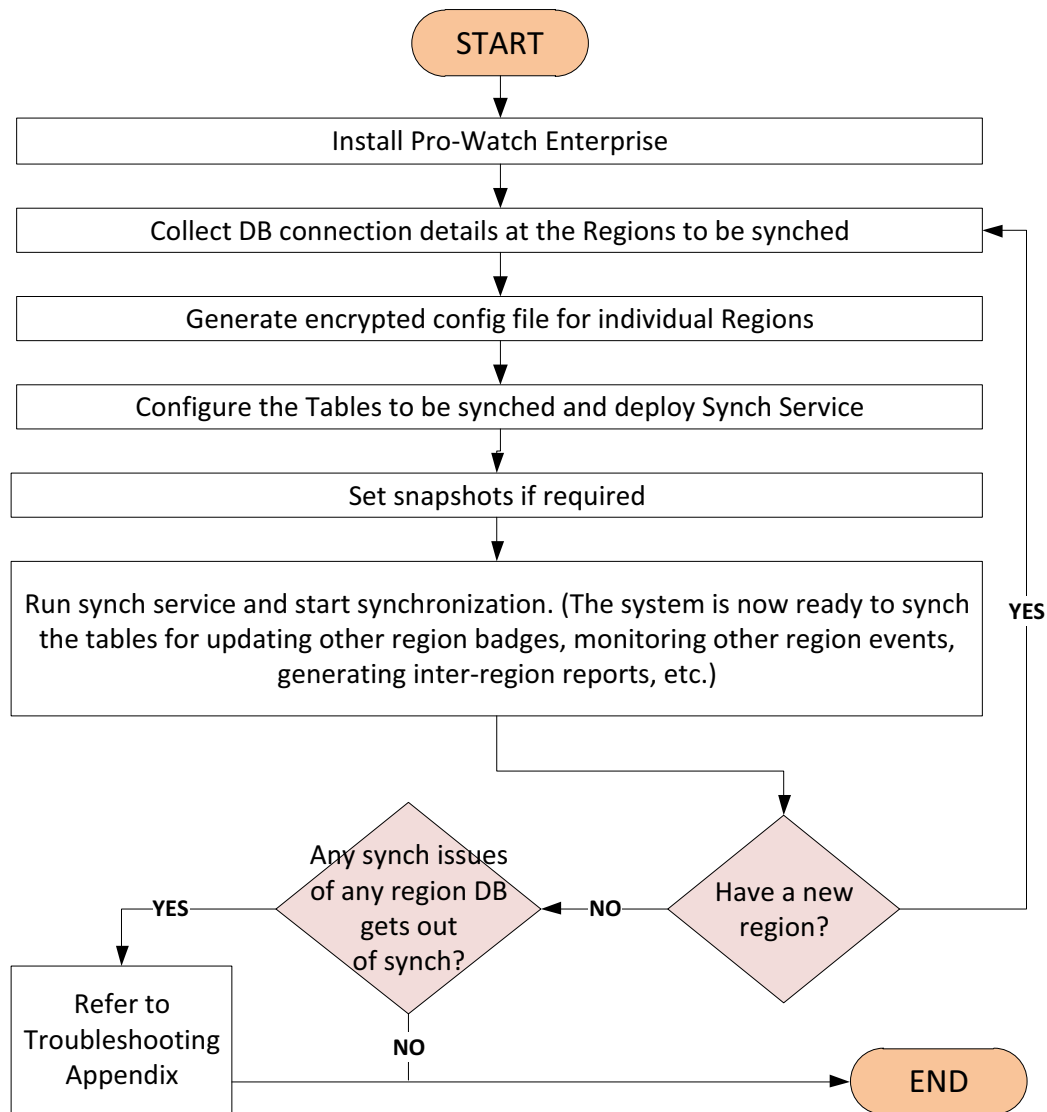
Enterprise Setup

2

In this chapter...

2.1 Overview

This chapter explains how to configure a Pro-Watch Enterprise system. An Enterprise system, by definition, requires the coordination of multiple systems, personnel, and infrastructure. Enterprise configurations vary from enterprise to enterprise, depending upon each enterprise's needs. However, all Enterprise systems consist of multiple regional Pro-Watch installations and a central Enterprise server used as a data repository and central hub.

Enterprise supports different schemas and a "**minimum synchable set**."

2.2 Setting Up the Pro-Watch Enterprise System

The following **sample flow chart** identifies the basic tasks required to set up a Pro-Watch Enterprise system:

```
                          ┌─────────────┐
                          │    START    │
                          └──────┬──────┘
                                 │
        ┌────────────────────────▼────────────────────────┐
        │          Install Pro-Watch Enterprise           │
        └────────────────────────┬────────────────────────┘
                                 │
        ┌────────────────────────▼────────────────────────┐
        │ Collect DB connection details at the Regions    │◄──┐
        │ to be synched                                   │   │
        └────────────────────────┬────────────────────────┘   │
                                 │                             │
        ┌────────────────────────▼────────────────────────┐   │
        │ Generate encrypted config file for individual    │   │
        │ Regions                                          │   │
        └────────────────────────┬────────────────────────┘   │
                                 │                             │
        ┌────────────────────────▼────────────────────────┐   │
        │ Configure the Tables to be synched and deploy    │   │
        │ Synch Service                                    │   │
        └────────────────────────┬────────────────────────┘   │
                                 │                             │
        ┌────────────────────────▼────────────────────────┐   │
        │           Set snapshots if required              │   │
        └────────────────────────┬────────────────────────┘   │ YES
                                 │                             │
        ┌────────────────────────▼────────────────────────┐   │
        │ Run synch service and start synchronization.     │   │
        │ (The system is now ready to synch the tables     │   │
        │ for updating other region badges, monitoring     │   │
        │ other region events, generating inter-region     │   │
        │ reports, etc.)                                   │   │
        └──────────────┬──────────────────────────┬────────┘   │
                       │                          │            │
```

Any synch issues of any region DB gets out of synch? — YES → Refer to Troubleshooting Appendix

NO (from "Any synch issues...") ← Have a new region? — NO → (to "Any synch issues")

Have a new region? — YES → (back to Collect DB connection details)

Any synch issues of any region DB gets out of synch? — NO → END

2.2.1 Updating and Setting the License

The Enterprise server machine must be capable of communicating with all of the panel types across the enterprise. The license enables the server to do this. Therefore, you must be sure that the license on your Enterprise server is updated to provide this capability. After the server's license is updated, it must also be set for server operation. To have the license updated and activated, contact your nearest customer support representative.

To determine whether a license is currently set as an Enterprise server or a Standard server, see the License Information screen. In the Pro-Watch wizard, select License Information.

2.2.2 Technical Specifications

- OS: Windows Server 2012 R2 or above
- SQL : SQL 2012 Standard/Enterprise or above.
- RAM: 16 GB minimum, 32-64 GB recommended.

Note: The specifications are subject to changes due to market conditions, software updates, manufacturing changes, and other variables outside of our control. Honeywell recommends for planning based on system growth and expansion, operating system updates and upgrades, database engine updates and upgrades, end user system expansion, historical data retention requirements, and archive data storage requirements. Please consult with Honeywell as applicable for assistance.

2.2.3 Prerequisites and Technical Specifications

- OS: Windows Server 2012 R2 or above
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Verify that the following software is installed before you create an Enterprise system:

- **Pro-Watch Corporate Edition, Release 4.4**

This procedure requires three separate PC systems that are connected and communicating via a local area network:

The configuring PC will be loaded with the complete Pro-Watch server and client applications, and it will have a complete Pro-Watch SQL database. The software key must be installed on this system, and it must be installed before the Pro-Watch program. If the key is not in place before you install Pro-Watch on the configuring PC, the program will load as a regular Corporate Edition. This would require a complete de-installation and a fresh start. Note that after the Enterprise PC has been fully configured, you can convert the configuring PC to a Regional server.

The actual Enterprise PC will become the Enterprise server. It must have SQL and Pro-Watch Client loaded on it, but it SHOULD NOT have a Pro-Watch Server program or database. The collection databases for Cardholders, Event logs, and all Hardware configurations will exist on this unit. Also, the Regional database copies will be retained here. If a Pro-Watch database exists on this unit, it will be ignored by the program and will serve no purpose. Note that this PC CANNOT also be used as a Regional server.

Warning: A strong working knowledge of networking and Microsoft 2012 Database management is critical to the success of your enterprise.

- Use SQL 2012 or above only with all latest updates from Microsoft.

- Identify the Regions' Pro-Watch databases that to be synchronized with Enterprise. [We will use this during cfg file generation]

- Note down the list of Pro-Watch DB tables to be synchronized.
  - All tables used to synch must have primary key s. Microsoft SQL Change Tracking feature needs primary keys as a prerequisite.

- We should split the tables logically to 2 categories. Type 1 and Type 2. i.e,
  - Type 1: Syncs changes from Region to Enterprise DB only. [Unidirectional] Ex: Events
  - Type 2: Syncs changes from Region to Enterprise and vice versa [Bidirectional] Ex: Badges

- Have an Enterprise DB created with all required tables to sync with Regions.

- Ensure that the columns present inside each table of Enterprise database are also present in all region Pro-Watch database tables. i.e All columns present in Enterprise table must be subset/equal of columns in all region databases.

- All custom fields those to be synchronized with Enterprise Server DB must be added in Enterprise and Region databases explicitly. [So, do not use dbo.BADGE_FIELDS table for syncing across Regions]

- Add all regions and Enterprise workstations to all regions and Enterprise Pro-Watch databases.

2.3 Precautions

- After the Enterprise is setup and working, if you are restoring any old backup to Region; then
  - First stop the sync service.
  - After restoring backup and before making any snapshot, ensure that you launch ProWatch UI and see everything normal in region.
  - Then start the sync service and perform snapshot if required.

- Always/wherever relevant take safe backup of databases [Enterprise and Regions] throughout the deployment of this application.

- All the changes made to a table will be retained in the change table for the given retention period only, which will be replicated by synch service. If synch service was not running or if the synch was not functioning due to any reasons beyond the retention period time, then those changes will be removed from SQL Change Tracking Table List and will not be synched with other regions at all.

- Do not use HSDK_CHNAGELIST for syncing.

- Do not use BADGE_C_LASTACC for snapshot.

- Do not use SAGEM_DOWNLOAD for snapshot.

Cautions Specific to Release 4.4:

- Check syncing manually to ensure proper functioning of the application since there is no UI for the synch application. The system does not issue an automatic alert when the synch service goes down. You must check the logs of synch service often for any errors in synching since there is no automatic error reporting mechanism.

- Time-stamp for log entries in the log file is always shown in UTC-0 converted format.

• The time stamps synch between regions and the Enterprise DB will not be converted or will not have the origin time-zone information.

• Use system task manager to stop synch service if required. Synch service name is the same for all regions, i.e. DataSyncServ (32 bit). Confirm its corresponding region by going to the Properties detail of the service.

• The synch is a database-to-database function. Thus, any external procedure which is invoked from ProWatch UI during the same operations will not be executed or handled by the synch service. [For example, during Custom badge field addition from UI, apart from BADGE_FIELDS table entry it also invokes an entry to Badge_V table which will not be happening when BADGE_FIELD table get synced with other region database.]

• Card update (enable or disable) operation from one region will not initiate download to panels in the other regions. The updating operation will allow one extra access/host grant in the other regions.

• There is no information available for differentiating data objects from different regions. Until this gets implemented, users may assign appropriate names to such objects to differentiate them.

• When the users perform bulk operations on databases (Archive, Purge, etc.) or performing snapshots, the synch service may consume more RAM memory and CPU than usual. Recommendation is to start the region synch services one by one after the snapshot completed with any specific region.

• In Task Manager, if the name of service is PWE_DataSync_MicroServ but not the regular name DataSyncServ, error might have occurred during syncing. It is recommended to refer to log file for corrective actions.

2.4 Enterprise DB Configuration

Pro-Watch Enterprise database is created automatically when you select the "Database Only" or "Complete" option when installing **Pro-Watch 4.4**.

2.5 Configuring Enterprise Synchronization

The same version of Pro-Watch Server must be installed on all Enterprise systems. The Enterprise system consists of a minimum of three workstations — one Enterprise server and two Region systems. The default database is installed. Note that the Regional systems should have C: drives with enough space to hold the distribution database for up to two weeks. For installation instructions, see the *Pro-Watch Software Suite Installation Guide* for your Pro-Watch version.

⚠ **Caution:** If you are updating an existing Pro-Watch installation, be sure to back up the existing Pro-Watch database before converting the machine to an Enterprise server or Regional server. Consider the size of the EV_log table before converting a machine as well—one million records in the table will significantly affect the enterprise's data storage and the time required to convert the machine to an Enterprise system.

Install Sync frame work on Enterprise server where the sync services are going to run.

Apply Enterprise License on Pro-Watch.

Copy the Enterprise Application to Enterprise Server computer. One folder serves for one region. So, have as many copies of the folder as the number of Regions to be synchronized.

2.5.1 Two Types of Synching

Synching is one of the most important functions of the Enterprise.

There are two types of synching:

1. **PULL [Type 1]**. Pull the DB changes from the Region to the Enterprise. This is also known as "**Transaction Replication**."

2. **PULL–PUSH [Type 2]**. Pull the DB change first from the Region to the Enterprise, and then from the Enterprise to all the other Regions. This is also known as "**Merge Replication**.

2.5.2 Deletion on Enterprise

"Deletion on Enterprise" feature is turned off by default.

The actual behavior of this feature depends on the kind of synching configured.

1. **PULL Synching and Deletion**

If there is a delete in a **Region**, it will not be not automatically deleted on the **Enterprise**.

2. **PULL–PUSH Synching and Deletion**

If there is a delete in a **Region**, it will be deleted on the **Enterprise**.

2.5.3 Configuration Steps

1. Install **Microsoft Sync** framework.

2. Generate encrypted cfg file for all regions using the "**Connection String Encryption Tool**".

3. Keep each regions' cfg file in respective folder. Change the Sync interval if required. By default, it is 10 seconds.

4. Execute SQL query to create **PWENT_META_DATA** table in Enterprise and all Regions Pro-Watch databases. [Refer to the installation package for the query]

5. Execute SQL query to create **PWENT_RESULTS** table in Enterprise and all Regions Pro-Watch databases. [Refer to the installation package for the query]

6. Using the list of tables identified for sync and their Type of sync, form query as shown in below example:

   INSERT INTO PWENT_META_DATA (PWENT_WRKSTN_ID,anc_table,anc_received, anc_sent, anc_server_applied ,TYPE) values (<Region workstationID>,<Table_Name>,0,0,0,<Type_value>)

   Example:

   - Type 1

        INSERT INTO PWENT_META_DATA (PWENT_WRKSTN_ID,anc_table,anc_received, anc_sent, anc_server_applied ,TYPE) values (0x00123341393243334 2412D373935342D3438,'dbo.EV_LOG',0,0,0,1)

   - Type 2

        oINSERT INTO PWENT_META_DATA (PWENT_WRKSTN_ID,anc_table,anc_received, anc_sent, anc_server_applied,TYPE) values (0x0012323445 30414236412D423231312D3433,'dbo.BADGE',0,0,0,2)

7. Execute the above formed queries entirely in the specific Region's and Enterprise's Pro-Watch databases. [Note: Should not execute this on other Regions' DB].

8. Update **EV_LOG** index properties. Remove 'Unique'. After installing the database, clear the **Unique** check-box on **Cluster** Index of the **EV_log** table on Pro-Watch Enterprise database.

9. Enable change tracking on (a) Pro-Watch Database, (b) All individual tables that you used in step 5 above. [Perform in both Enterprise and Region]. Keep the desired values for data retention.

   a. Database Level [Region & Enterprise]

   1. Right-click the PWNT database and select Properties from the pop-up menu.

   2. Locate the Change Tracking field in the Properties dialog box and change its value to TRUE.

   3. For Duration select required days as per the organization policy.

   4. Repeat this procedure for all databases.

   b. Table Level

   1. Right-click the table that you'd like to track and select Properties from the pop-up menu.

   2. Locate the Change Tracking field in the Properties dialog box and change its value to TRUE.

10. Start the sync service application from each regions folder. Look for DataSyncServ process in task manager.

2.6 Snapshots

Taking a snapshot of the DB is another important function of the Enterprise.

If you are adding a new Region, you'd need a new snapshot.

To take a snapshot, enter the value "**1**" into the **Snapshot** column of the **Meta Data table**.

2.6.1 How to Perform Snapshots [Region DB to Enterprise DB]

1. Identify the Workstation ID for the region that you are going to perform Snapshot.

2. Identify the tables to be used in snapshot.

3. Stop the sync service for that region.

4. In PWENT_META_DATA of Enterprise Database, set the Snapshot value as 1 for those tables against the WrkstID of the specific region.
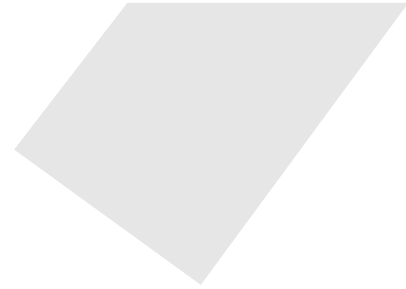
5. Start the sync service now.

Note: After completing the snapshot process, the value "Snapshot" in PWENT_META_DATA table will be set to zero.

Troubleshooting Tips

A

In this appendix ...

A.1 Troubleshooting Tips

	Symptom	Workaround
1.	Error in log file : "Not obtained the value for command parameter at RID on command conflict update command"	(Reason : anc_received / anc_sent between the enterprise and concerned region is not matching.) Need to reset anc_received / anc_sent of concerned servers.
2.	After DB restore, the records for Badge_V (or any one table of type 2) is not syncing. Continuous errors were present and rollback	(Reason: After database restore the min_valid_version and current version become older. Anc_received has already processed) Launch UI and ensure DB restoring was successful before starting sync service. Also, Need to reset anc_received / anc_sent of concerned servers
3.	After DB restore the records were not inserted. Error like "Cannot enumerate changes for the table ……"	(Reason: After database restore the min_valid_version and current version become older. Anc_received has already processed) Launch UI and ensure DB restoring was successful before starting sync service. Also, Need to reset anc_received / anc_sent of concerned servers

4.	One of Badge tables were not snapshotting with a timeout as well as rollback.
	
	DoPullSync Function - Failed to execute the command 'InsertCommand' for table 'dbo.BADGE_C'; the transaction was rolled back. Ensure that the command syntax is correct.
		(Reason: Trigger enabled creating a deadlock.
		
		    - HSDK_Changelist table
		    - Badge_Last_Acc
		)
		Disable triggers in Enterprise and Region DBs (except source region of snapshot) before starting snapshot.
		
		--
		
		Increase timeout value in cfg file.
		
		Check for any huge DB operation like purging or backups and time it appropriately
		
		--
		
		Ensure that system is having enough memory on the enterprise server to handle large loads
		
		--
		
		(Reason: In case of too huge a changeable entries) Have one or 2 days retention period for change table based on the sync interval.

5.	Records were not getting inserted or the application crashes	Reason : Cfg.xml has a wrong database / connection string either for server (enterprise) or for client (regional). Generate the cfg file again and check if the issue occur again.
6.	Application Starts and crashes	Check system Event Viewer . If it shows error in checkAndSetAncValues() check the table names and count matches in client and server.
7.	Sync not happening (or) Service is not starting (or) Synch service crashing soon after starting	Check if workstation Id is defined is correct and check if unnecessary spaces are causing. Ensure that all table names present in region DB PWNT_META_DATA table are present in Enterprise DB PWNT_META_DATA table. The columns of tables specified in PWNT_META_DATA table in the Enterprise DB must be subset of those tables in Region DB.
8.	During sync of Ev_log table error 'Invalid column Evt_Dat' is thrown	Open ev_log table → Indexes→EV_LOG_I6 right click on properties uncheck **Unique** checkbox.

9	Error in log file: TimerTick – Object reference error	Add PWNT_RESULTS table in ENT and Regions.
10	Error in log file: "Cannot Enumerate region"	Check PWNT_META_DATA table and ensure that PWENT_WRKST_ID values are correct.
11	Error in log file: "Timeout Expired"	Check if there are/were any large operations happening on SQL database. Check the SQL service memory consumption and system performance.
12	Error in log file: "Exception at check and set values"	Check SQL connectivity, SQL access permission and connection string used in cfg file etc.

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