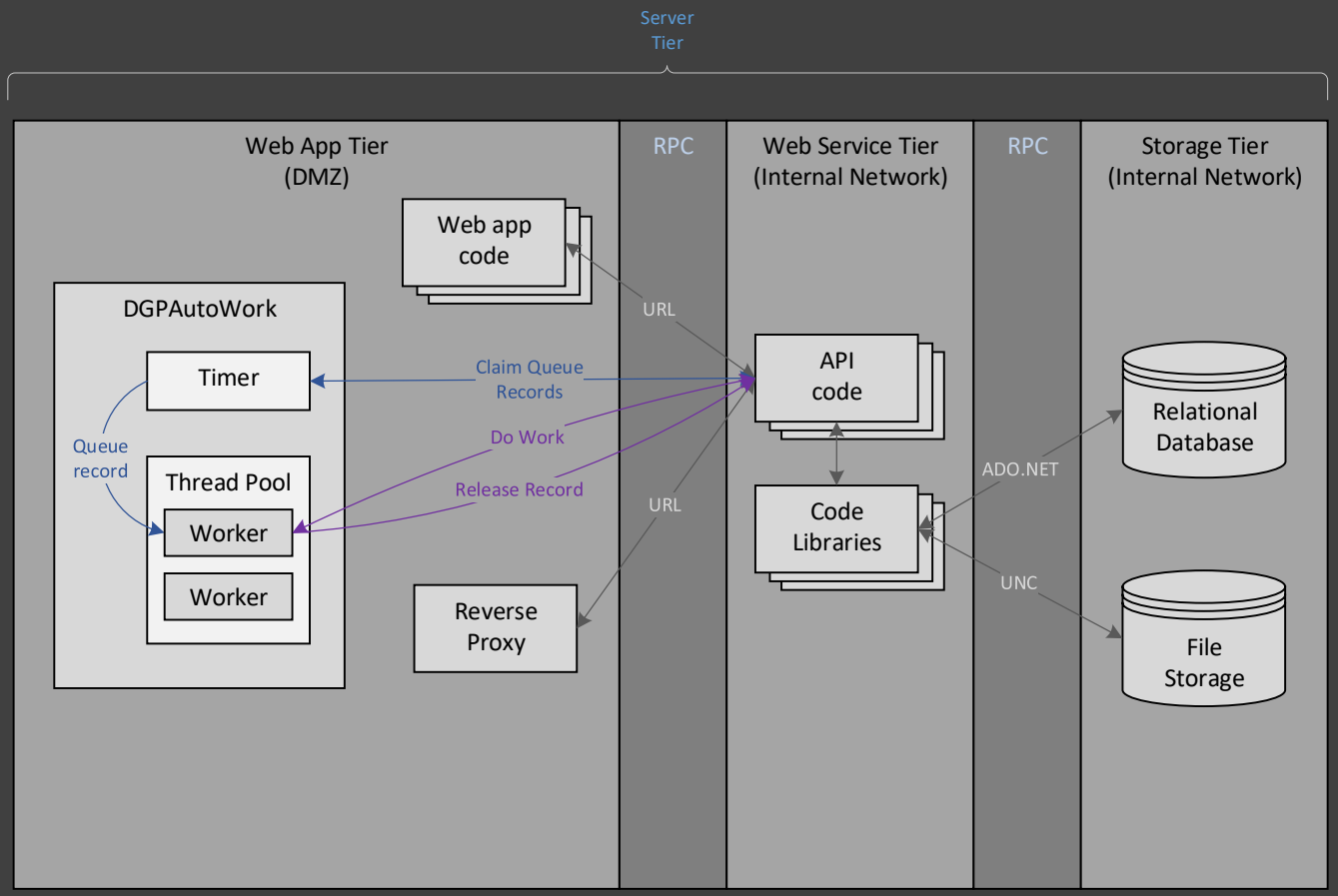
Automation

The DGPAutoWork Windows Service:

- Claims queue records which act as a token controlling the execution of each automated process
- Each claimed record is handed off to its own worker thread to run in parallel
- Each worker thread calls one or more API methods to do the work of the process and then calls another API method to release the queue record



DGP has its own redundant, scalable, high performance subsystem which constantly runs iterative processes (such as merge replication) in the background. The system itself is a federated computing system patterned after the functionality of the Windows IIS web server's HTTP.sys listener in that a main process obtains (claims) a batch of work items, and then hands them off to a pool of

worker threads for execution. At that point the main process is done and it resumes polling for the next batch of work items. Once a queue record has been claimed, the worker thread that it is handed off to has the exclusive "right" to execute that process.

Each worker thread runs a one-way "fire and forget" autonomous process that updates its own state info after its work has been completed. This architecture works well for the HTTP.sys listener when handling large numbers of incoming HTTP requests, and it works equally well as the basis for the continuous iterations of DGP's automated processes. All of the actual work is done by calling API methods (with full security), so the automated process methods are really nothing more than orchestration of the calls to web service API methods.

The federated computing architecture allows the AutoWork subsystem to scale out horizontally by adding more processing nodes in each location, as needed. Also, implementing all automated processing work as IO-bound RPC's (API method calls) allows the thread pool threads managed by the Task Parallel Library to be used with IO-completion ports very efficiently, with excellent scalability.

Automation Verification

1. *The AutoWork Tester test harness is the primary tool used to test and verify the correct functionality of automated processes. By turning logging on, the details of each process are saved to the AutoWorkLog of the SysMetrics database.*
2. *Automated processes are configured with performance thresholds (upper limits), and any iteration of a process that exceeds those limits will log an error in the DGPErrors table with the relevant information.*
3. *The work of each automated process is actually done by web service API methods, and those methods can be tested and verified using the API Tester test harness.*
4. *The AutoWork app is a hybrid Windows service and console app that can be run as an ordinary exe to see data about each process displayed in the console screen. Usually, it would be registered as a service and run automatically.*
5. *The testing, detection, repair and monitoring tools are themselves free and open-source, and are included as part of DGP. This enables the correct functionality of the tests and test harness logic to be independently verified by anyone that has access to the source code.*