Appendix D

MASSEY UNIVERSITY
Application for Approval of Request to Embargo a Thesis
(Pursuant to AC98/168 (Revised 2), Approved by Academic Board 17/02/99)

Name of Candidate: JEFFREY PAUL BRIDGES ID Number: 12159110

Degree: MASTER OF ENGINEERING Dept/Institute/School: SEAT

Thesis title: Development of a multi-historian SCADA data collection middleware

Name of Chief Supervisor: Edmund Lai Telephone Ext: 41580

As author of the above named thesis, I request that my thesis be embargoed from public access until (date) 01/05/2015 for the following reasons:

☑ Thesis contains commercially sensitive information.

☐ Thesis contains information which is personal or private and/or which was given on the basis that it not be disclosed.

☐ Immediate disclosure of thesis contents would not allow the author a reasonable opportunity to publish all or part of the thesis.

☐ Other (specify):

Please explain here why you think this request is justified:

The thesis contains details of the implementation of a commercial product. Making this information public immediately could provide an advantage to their competitors.

Signed (Candidate): JBridges Date: 29/04/2013

Endorsed (Chief Supervisor): Name Date: 29/4/2013

Approved/Not Approved (Representative of VC): [signature] Date: 2/05/13

Note: Copies of this form, once approved by the representative of the Vice-Chancellor, must be bound into every copy of the thesis.

Development of a multi-historian SCADA data collection middleware

A thesis presented in partial fulfilment of the
requirements for the degree of

Master of Engineering
in
Computer and Electronic Engineering

at Massey University, Albany, New Zealand

Jeffrey Paul Bridges
2013

Abstract

This thesis details the implementation of a SCADA middleware package designed to provide a common interface to the most commonly used SCADA historians in use within local government in New Zealand. The middleware integrates with a New Zealand developed cloud based solution that is used throughout the country for compliance monitoring and reporting of water and wastewater treatment facilities.

The middleware connects via the internet to the historians hosted on-site within council networks and retrieves data which is replicated in a local database. This approach provides backup for the data and allows it to be accessed quickly when required for reporting. The middleware database is hosted within a Microsoft SQL Server instance to ensure compatibility and ease of rollout when paired with the commercial cloud solution.

To ensure reliable data collection and resilience to connection interruption all transactions made against the client historians are controlled by a queue stored in the middleware database. The middleware includes an inbuilt mechanism for integrity checking to ensure all data available in the client historian is collected and has been designed to run with minimal intervention of company staff.

To reduce storage requirements the middleware includes a data deduplication system that removes repeated samples from the SQL Server database after integrity checking has been performed. This provides a lossless compression mechanism that does not alter the precision of the data collected.

The middleware implementation has now been in use in a production environment collecting data from councils for compliance purposes for approximately six months. During this time data collection has been very reliable with the middleware handling numerous connection outages without intervention.

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