



Attachment 10: Specifications of the WA Data Linkage System (WADLS)

Technical specifications

The WADLS and its associated tools and systems comprise Oracle and PostgreSQL databases and a suite of complementary applications, situated on multiple Solaris servers, maintained within the Data Linkage Branch (DLB). DLB's technical teams (Linkage, Systems and Data Delivery) access these systems via a UNIX shell environment. Staff are experts in their respective fields, skilled in a variety of programming languages and software packages necessary to perform DLB's specialised processes. These include standard operational tasks as well as the creation and modification of linkage infrastructure to meet the dynamic requirements of linking multiple datasets and creating customised linked data products. Proprietary software is used as well as a variety of bespoke applications designed and implemented by the technical teams. This includes DLB's end-to-end linkage application, 'DLS3' (in progress). All technical staff require extensive hands-on training to achieve competence in upkeeping the WADLS and associated tools and systems.

Skills required to operate and maintain the WADLS (including associated tools and systems)

DLB has three technical teams: (i) Linkage (Linkage Officers); (2) Systems (Software Developers and Systems Administrators); and (iii) Data Delivery (Data Analysts). Below is a full list of routine duties and the skills and knowledge required.

Field	Duty	Skills	Team(s)
Development	Creating and enhancing custom applications	<ul style="list-style-type: none">• Python• PostgreSQL• C/C++• PLSQL• Oracle (OCI)• GUI design (QT)• Communications (Twisted, REST)• Geocoding• Perl• Django	DLB Systems Team



Field	Duty	Skills	Team(s)
	Application Testing	<ul style="list-style-type: none">• Testing framework• Testing scripts• Unit testing• Integration• UI testing• Database testing	DLB Systems Team DLB Linkage Team
	Deployment	<ul style="list-style-type: none">• Jenkins• Deployment scripts• Packaging methodology• DB schema migrations	DLB Systems Team
	Version Control	<ul style="list-style-type: none">• Git• Bzr (legacy system)• Jenkins	DLB Systems Team
Systems Administration	User Access	<ul style="list-style-type: none">• Solaris• Samba• LDAP• Database	DLB Systems Team
	Security Settings	<ul style="list-style-type: none">• All of the above• SSL• Apache• Xymon	DLB Systems Team
	Upgrades	<ul style="list-style-type: none">• All of the above• Solaris package management• Boot env. management	DLB Systems Team
	Backups	<ul style="list-style-type: none">• ZFS• DB backups & snapshots• Oracle Secure Backup• Tape management• Operation of tape drives	DLB Systems Team



Field	Duty	Skills	Team(s)
	Optimisation	<ul style="list-style-type: none">• ZFS• Database indexing• Database configuration• Application profiling	DLB Systems Team
	Solaris Administration	<ul style="list-style-type: none">• Ansible• SMF configuration• Disk space management• Hardware management• Zones	DLB Systems Team
	User Support	<ul style="list-style-type: none">• Postgres & Oracle DBA• Application knowledge• Dev of applications as required (see above)• User training	DLB Systems Team
Data Handling	Data Evaluation	<ul style="list-style-type: none">• Unix command line• Vim & other text editors• Analytical skills• File formatting• Data knowledge	DLB Linkage Team
	File Manipulation & Troubleshooting	<ul style="list-style-type: none">• As above	DLB Linkage Team
	Data Importation	<ul style="list-style-type: none">• As above• Import profile scripting• Fit testing• SQL	DLB Linkage Team DLB Systems Team
	Data Cleaning	<ul style="list-style-type: none">• Cleaning scripts• Analytical skills	DLB Linkage Team
Data Linkage	Preparing Data for Matching	<ul style="list-style-type: none">• Shell scripting• SQL• Block preparation	DLB Linkage Team



Field	Duty	Skills	Team(s)
	Linkage Strategy Creation	<ul style="list-style-type: none"> Analytical skills Linkage concepts Data knowledge Weight analysis 	DLB Linkage Team
	Data Matching	<ul style="list-style-type: none"> WADLS literacy 	DLB Linkage Team
	Clerical Review	<ul style="list-style-type: none"> As above Analytical skills Data knowledge 	DLB Linkage Team
	Link Checking & Creation	<ul style="list-style-type: none"> Python Data knowledge Analytical skills 	DLB Linkage Team DLB Systems Team
	Retrieval of Links & Data	<ul style="list-style-type: none"> SQL Database tools (many, customised) 	DLB Linkage Team DLB Systems Team
Creation of Study Groups (for projects, requests, etc)	Cohort Creation and Group Filtering	<ul style="list-style-type: none"> SQL Unix command line Shell scripting Vim & other text editors SAS Perl Python DLB Linkage Team Database tools (many, customised) Analytical skills Data knowledge WADLS literacy 	DLB Linkage Team
	Linkage Key Extraction	<ul style="list-style-type: none"> As above 	DLB Linkage Team
	Family Connections	<ul style="list-style-type: none"> As above 	DLB Linkage Team
	Control/Sample Selection	<ul style="list-style-type: none"> As above 	DLB Linkage Team
	Value-adds	<ul style="list-style-type: none"> As above 	DLB Linkage Team



Field	Duty	Skills	Team(s)
Delivery of Linked Service Data	CARES Data importation	<ul style="list-style-type: none">• Unix command line• Shell scripting• Vim & other text editors• SQL• Data knowledge	DLB Data Delivery Team
	CARES Extraction & Customisation	<ul style="list-style-type: none">• As above• SAS• ODBC• Analytical skills	DLB Data Delivery Team
	Quality Checking	<ul style="list-style-type: none">• Unix command line• SAS• Analytical skills• Data knowledge	DLB Data Delivery Team
	CARES System Upkeep	<ul style="list-style-type: none">• GIT• Postgres DB• Server SAS	DLB Data Delivery Team
Geocoding	Geocoding systems	<ul style="list-style-type: none">• Software tuning• Maintenance of reference data• DB management• Software updates• Systems integration	DLB Systems Team
	Creation of geocodes	<ul style="list-style-type: none">• Analytical skills• Geocoding UI literacy	DLB Linkage Team
Knowledge Management & Continuous Improvement	Process Documentation	<ul style="list-style-type: none">• Process knowledge• Documentation skills• Data knowledge• Dokuwiki• Trac	All DLB technical teams



Field	Duty	Skills	Team(s)
	Metadata Creation	<ul style="list-style-type: none">• As above• Analytical skills• Unix command line• Shell scripting• SQL• Database tools (many, customised)	All DLB technical teams
	Statistical Reporting	<ul style="list-style-type: none">• As above	All DLB technical teams
	Feedback to Collections	<ul style="list-style-type: none">• As above	All DLB technical teams