

Relationship between WRON, AWDIP and AWRIS

Introduction

A data infrastructure is a suitable combination of technologies, standards, policies and institutional arrangements that promote the availability of, and access to data. A data infrastructure also provides a basis for data discovery that assists in greater use and realising greater value from that data for a variety of users with different interests.

There are currently three initiatives underway in Australia that are either promoting the development of a water data infrastructure and/or require the existence of such an infrastructure. These are the Water Resource Observation Network (WRON), the Australian Water Data Infrastructure Project (AWDIP) and Australian Water Resources Information System (AWRIS).

In this paper, a brief description of each initiative is given without providing substantial technical analysis. The objective of this paper is to show that they are complementary.

WRON

The Water Resources Observation Network (WRON) is an information system that interlinks Australia's many water and related data assets, and harnesses new data streams from satellites and on-ground sensor networks. It couples these data to a new generation of web-based forecasting and reporting technologies. The WRON will radically improve the visibility, currency and usability of information on our water resources. Refer to Figure 1 for a broad schematic representation of WRON.

The WRON initiative recognises that the management of Australia's water into the future will require access to a broad range of new information products, including real-time, near real-time, remotely sensed and modelled data. Furthermore, these data sets will be owned and managed by a diverse range of organisations (potentially hundreds) around the country including all levels of government and the private sector.

A key component of the WRON is the definition of a framework that, when implemented, will achieve the level of interoperability required to support such a highly distributed system. This framework is documented in the WRON Reference Model (WRON-RM) which describes key use cases, required governance regimes, key information artefacts, an interoperability framework and interface standards required.

To date, a roadmap for developing the WRON-RM as well as Version 0.1 of the Reference Model have been delivered. While WRON-RM 0.1 is not yet a complete Reference Model, it does provide enough information to allow the reader to understand the nature of the WRON

Framework. The next phase of development of the WRON-RM will be the development of reference implementations for each of the key artefacts as well as further development of the Reference Model.

AWDIP

The Australian Water Data Infrastructure Project (AWDIP) evolved in parallel with WRON with the objective of facilitating Australia-wide assessments of water resources through ongoing development of a comprehensive and accessible water information framework. The functionality being developed in AWDIP overlaps the WRON framework of interoperability standards and protocols shown in Figure 1. The AWDIP is a collaborative development under the guidance of the Executive Steering Committee for Australian Water Resources Information.

AWDIP currently contains the descriptions of more than 800 parameters. However, work to date has focussed on development of a demonstrator system for the delivery of data for a subset of water parameters in both aggregated and discrete form. This has been specifically aimed at providing the data needed for the calculation of indicators under the National Monitoring and Evaluation Framework. To this end, most collaborators in AWDIP have deployed prototype services¹ allowing for on-line access to some of the data held in their databases, thus providing a practical demonstration of the operation of a true distributed database system.

In the longer term, AWDIP will broaden to enable the delivery of a more complete set of surface water, groundwater, water quality and climate parameters. Whether or not to deliver a parameter by AWDI will be a decision made by each of the collaborators in the project

AWDIP does not span the full range of interoperability standards and protocols to be described in WRON-RM. It is not currently concerned with data discovery, other than through a simple registry (Australian Spatial Data Directory). The AWDIP model does not currently include provision for: service Access; Authentication; Authorisation; or Audit (AAAA) of services. It also is not focussing on access to real-time data nor provision of data for modelling services. The AWDIP model does however provide a protocol for off-line data delivery thus facilitating transfer of bulk data for use in modelling.

The development of standards and protocols will be augmented with publication of profile documentation, publication of service availability in a registry and development and implementation of governance arrangements during 2007-2008. Publication and implementation of these will allow the underlying framework to be recognised as a robust data infrastructure. The availability of the infrastructure will enable

¹ WA Department of Water, NSW Department of Water and Energy, SA Department of Water, Land and Biodiversity Conservation, Tas Department of Primary Industries and Water, Bureau of Meteorology, CSIRO

additional data custodians to establish data delivery services to provide access to "point of truth" data.

AWRIS

The Australian Water Resources Information System (AWRIS) is a tool that has its genesis in the recent AWR 2005. AWRIS should deliver on key aspects of the NWI, in particular to facilitate ongoing national assessments of water resources as well as providing a robust national water account.

AWRIS has been designed to access distributed information via a data infrastructure. This is referred to as the 'enabling framework' in the AWRIS specification. At the time of writing the AWRIS specification, it was envisaged that an enhanced AWDIP (beyond the 2007-08 workplan) could fulfil some of the requirements of this framework.

The release of the National Plan for Water Security (NPWS) during January 2007 redefined the responsibilities for water information in Australia. Under the NPWS the Bureau of Meteorology will have a major water information role, being responsible for undertaking both national assessments of water resources and providing a national water account as well as providing ready access to Australia's water information. The NPWS refers to the development of AWRIS and it is expected to remain within the 'WRON space' as shown in Figure 1. However, the initial scope and design will need to be reassessed in the light of the changed responsibilities for the management and delivery of water information, in particular the role of the Bureau of Meteorology.

Synergies and Conclusions

An overview of the relationship between the three initiatives described above with specific reference to the interoperability framework is shown in Figure 2. In this diagram significant system requirements for a successful data infrastructure are listed and the coverage of those aspects is detailed for AWDIP and WRON. To enhance the alignment between AWDIP and the WRON, the AWDIP Technical Working Group will investigate options for the adoption of appropriate sections of the WRON-RM. Overlaid on the figure also are the requirements of AWDIP from AWRIS.

Of note is that there are a number of components required for delivering the data infrastructure needed by Australia that are out of scope of the current AWDIP. These include service composition (where data and modelling services are seamlessly linked to provide assessments), registries (provide for information discovery as well as governance) and modelling services. Each of these involves significant technical challenges.

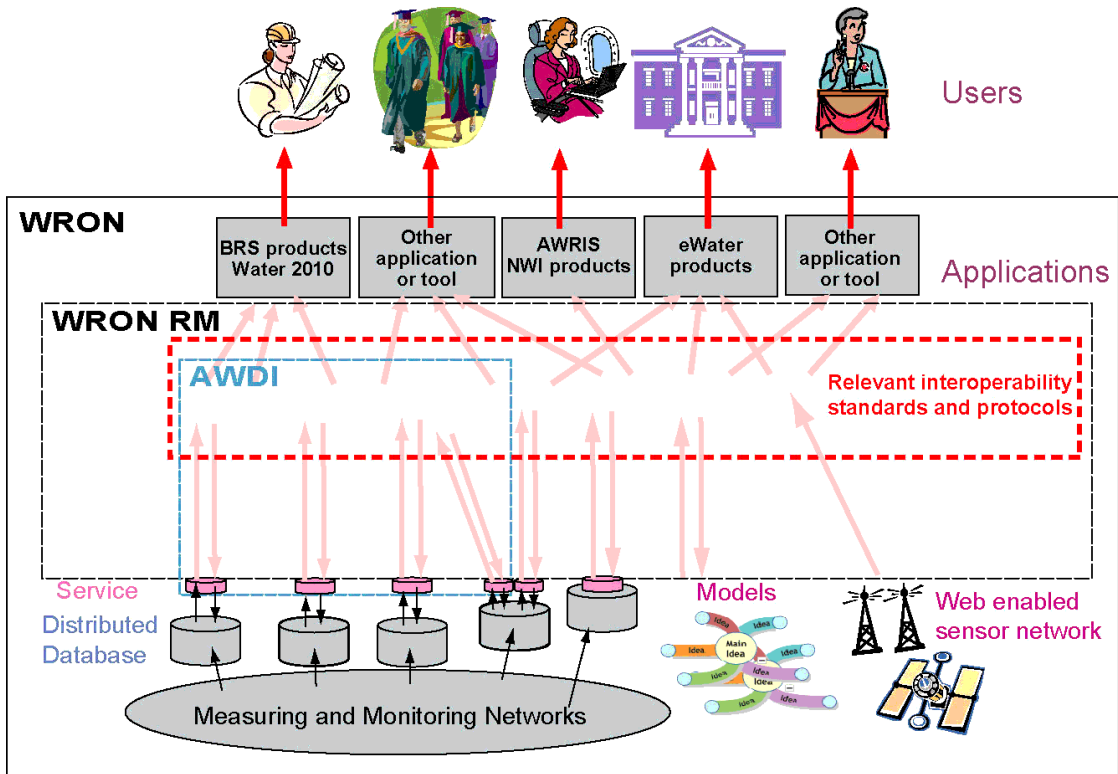


Figure 1 Schematic of the aspirational relationship between WRON RM, AWDIP and AWRIS

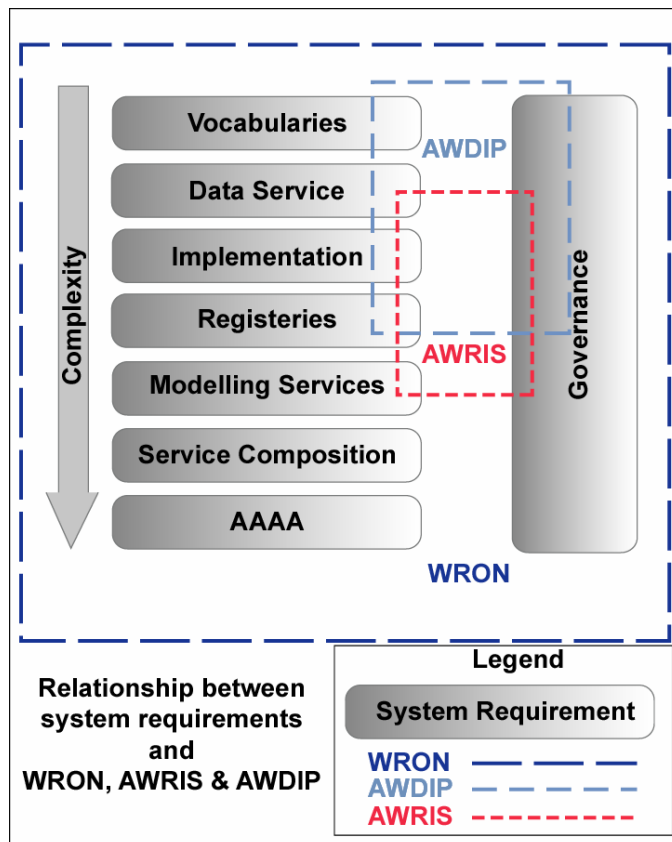


Figure 2 Aspirational relationship of AWDIP, AWRIS and WRON