Geodetic XML

Department of Sustainability and Environment

A consistent exchange mechanism for geodetic data in Australia and New Zealand

Roger Fraser (Aus) and Nic Donnelly (NZ)
ICSM Geodesy Technical Sub-Committee

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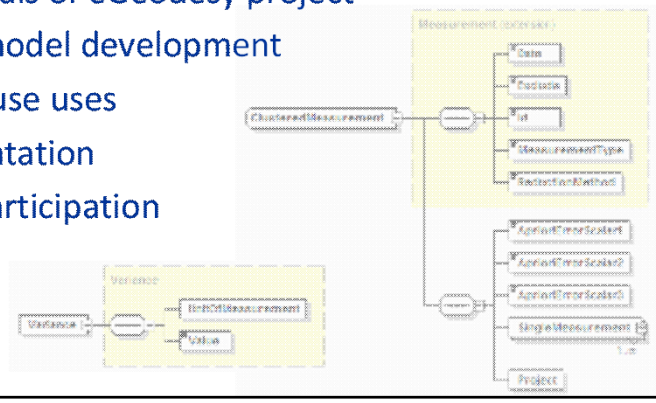
Outline

- Overview of geodetic data management in Australia and New Zealand
- Design goals of eGeodesy project
- Current model development
- Example use uses
- Implementation
- Call for participation



Geodetic data management in Australia

- Responsibility of all Australian Jurisdictions
- No standardised approach for geodetic data management
- Data collection via projects/campaigns and CORS
- High level of variability in:
  - Quality, procedural consistency
  - Instruments, standards, reduction, people
  - DBMS, proprietary binary and text file archives
- Data translation a common burden and prone to error

Geodetic data management in NZ

- Geodetic data managed by one national agency – Land Information New Zealand (LINZ)
- Data stored within Landonline database
- Geodetic survey and physical maintenance mostly carried out via contracts with private firms
- Data submitted via text files on physical media

Design goals for eGeodesy project

- Document process of datum maintenance in UML
- Geodetic data model requirements:
  - Standardise the vocabulary and encoding
  - Facilitate exchange between software products
  - Facilitate distributed network processing
  - Open standards, cross platform, object oriented
- Reduce data duplication and data “silos”
- Enable online geodetic measurement ‘validation’
- Eliminate translation dependency

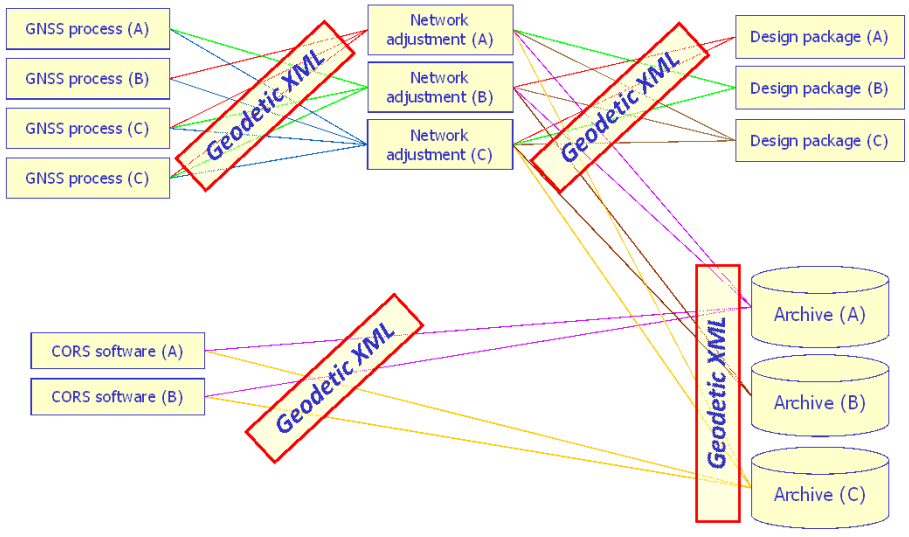
UML development

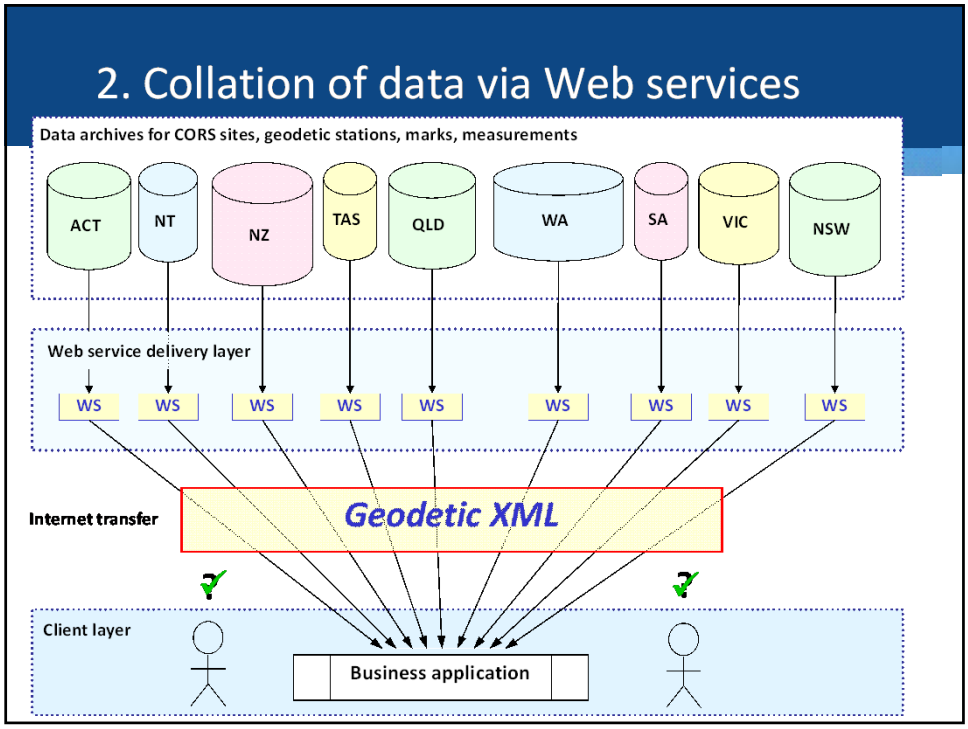
- 4D datum
  - References Aus/NZ ISO 19111:2004
  - Time
- All GNSS & terrestrial geodetic measurements
- Geodetic station and CORS information
  - References SOPAC IGS GNSS site log schema
- Physical Mark and monument information
- Adjustment configuration and results
- Projects and roles
- Quality and standards

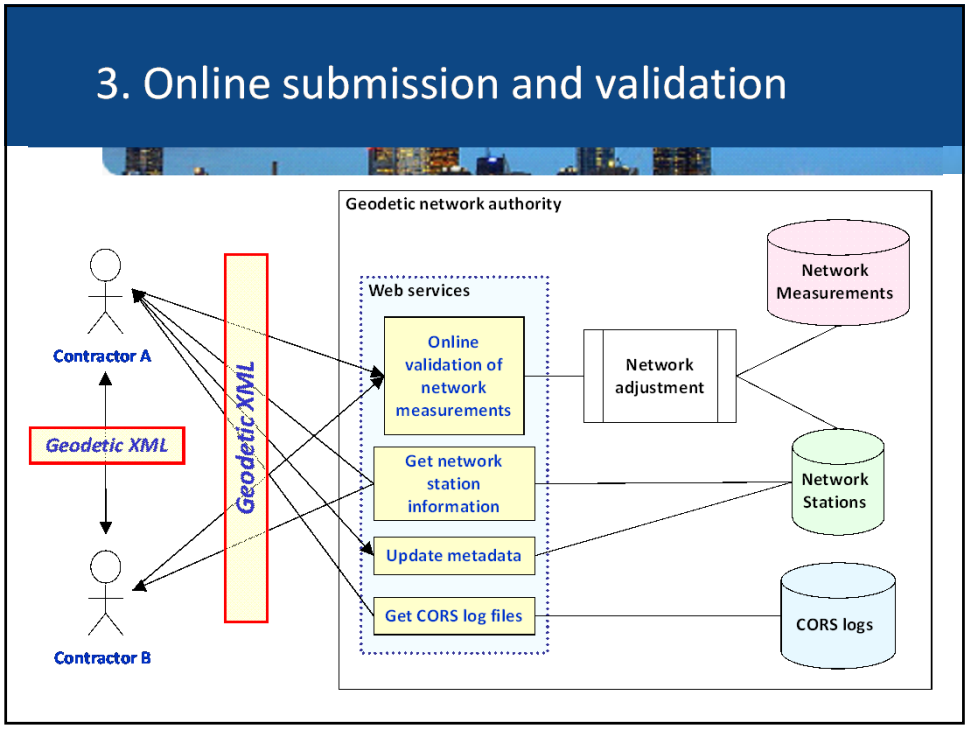
Example use cases and benefits

1. Data transfer amongst various applications
2. Collation of data from different custodians
3. Online submission and validation of geodetic measurements

1. Data transfer between applications




2. Collation of data via Web services
Data archives for CORS sites, geodetic stations, marks, measurements
ACT
NT
NZ
TAS
QLD
WA
SA
VIC
NSW
Web service delivery layer
WS
Internet transfer
Geodetic XML
Client layer
Business application

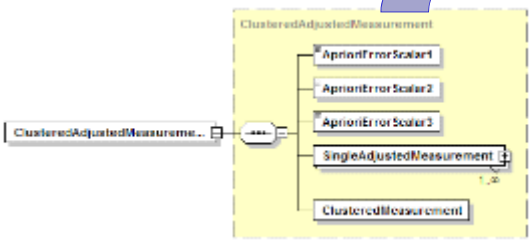

3. Online submission and validation
Geodetic network authority
Contractor A
Geodetic XML
Contractor B
Geodetic XML
Web services
Online validation of network measurements
Get network station information
Update metadata
Get CORS log files
Network adjustment
Network Measurements
Network Stations
CORS logs

XML schema implementation

- Technical implementation relatively simple
- Vendor uptake and support may take some time
- Software classes via “XML schema binding”
  - C++ , .NET , Java , Delphi , Perl , PhP …

XML schema (.XSD)

Source code




```
using namespace std;

class ClusteredAdjustedMeasurement :
 public ::xml_schema::complex_content
{
public:
 // Parser callbacks.
 virtual void pre ();
 // Overridden in implementation class
 virtual void AprioriErrorScalar1();
 virtual void AprioriErrorScalar2();
 virtual void AprioriErrorScalar3();

 virtual void SingleAdjustedMeasurement();
 virtual void ClusteredMeasurement();
 ...
```

Call for participation

Your input to the Geodetic XML schema design is welcome!

- XSD (beta version) available for testing
- Who can get involved?
  - All who have an interest in geodetic data management
  - Organisations, geodesists, software developers …
  - GNSS & survey software vendor participation is strongly encouraged

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Thank you!

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