Pragmatic service development and customisation with the CEDA OGC Web Services framework

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The CEDA OGC Web Services framework (COWS) emphasises rapid service development by providing a lightweight layer of OGC web service logic on top of Pylons, a mature web application framework for the Python language. This approach gives developers a flexible web service development environment without compromising access to the full range of web application tools and patterns: Model-View-Controller paradigm, XML templating, Object-Relational-Mapper integration and authentication/authorization. We have found this approach useful for exploring evolving standards and implementing protocol extensions to meet the requirements of operational deployments.

This paper outlines how COWS is being used to implement customised WMS, WCS, WFS and WPS services in a variety of web applications from experimental prototypes to load-balanced cluster deployments serving 10-100 simultaneous users. In particular we will cover 1) The use of Climate Science Modeling Language (CSML) in complex-feature aware WMS, WCS and WFS services, 2) Extending WMS to support applications with features specific to earth system science and 3) A cluster-enabled Web Processing Service (WPS) supporting asynchronous data processing.

The COWS WPS underpins all backend services in the UK Climate Projections User Interface where users can extract, plot and further process outputs from a multi-dimensional probabilistic climate model dataset. The COWS WPS supports cluster job execution, result caching, execution time estimation and user management. The COWS WMS and WCS components drive the project-specific NCEO and QESDI portals developed by the British Atmospheric Data Centre. These portals use CSML as a backend description format and implement features such as multiple WMS layer dimensions and climatology axes that are beyond the scope of general purpose GIS tools and yet vital for atmospheric science applications.