

Chapter 1

The Open Geospatial Consortium and Web Services Standards

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ABSTRACT

This chapter discusses the role of Open Geospatial Consortium (OGC) geospatial standards as a key aspect in the development, deployment, and use of Geospatial Web Services. The OGC vision for web services is the complete integration of geographic (location) and time information into the very fabric of both the internet and the web. Today, the Geospatial Web Services encompasses applications ranging from as simple as geo-tagging a photograph to mobile driving directions to sophisticated spatial data infrastructure portal applications orchestrating workflows for complex scientific modeling applications. In all of these applications, location and usually time are required information elements. In many of these applications, standards are the “glue” that allow the easy and seamless integration of location and time in applications - whether simple mass market or integration into enterprise workflows. These standards may be very lightweight, such as GeoRSS, or more sophisticated such as the OGC Web Feature Service (WFS) and Geography Markup Language (GML).

INTRODUCTION

This chapter is structured from the perspective of a standards organization and the work activities of

the OGC Membership. One of the key aspects of standards development is that the work activities are defined by the Membership and thus reflect market forces, business needs, and technology trends. Therefore, this chapter begins with an overview of the Open Geospatial Consortium

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(OGC), our vision, and mission. This is followed by definitions of what the OGC means by “services”, “web services”, and services architectures. We then describe the history of OGC web services standards work. In order to provide context, the chapter then provides information on the OGC Reference Model and the importance of Reference Architecture for the successful deployment of applications using OGC and related standards. This discussion is followed by short descriptions and examples of the use of key OGC web services standards. The chapter concludes with statements regarding planned future work on the OGC web services standards baseline as well as reflections on the impacts of current technology trends, such as the mobile internet and cloud computing.

BACKGROUND

This section provides background on the OGC, OGC Web Services, and key terms and definitions.

What is the OGC?

Founded in 1994, the Open Geospatial Consortium (OGC) is a global industry consortium with a vision to “Achieve the full societal, economic and scientific benefits of integrating location resources into commercial and institutional processes worldwide”. Inherent in this vision is the requirement for geospatial standards and strategies to be an integral part of business processes.

The OGC consists of 400+ members - geospatial technology software vendors, systems integrators, government agencies and universities - participating in a consensus process to develop, test, and document publicly available geospatial interface standards and encodings for use in information and communications industries.

Open interfaces and protocols defined in OGC standards are designed to support interoperable solutions that “geo-enable” the Web, wireless and location-based services, and mainstream IT, and to

empower technology developers to make complex spatial information and services accessible and useful to all kinds of applications. As such, the mission of the OGC is to serve as a global forum for the development, promotion and harmonization of open and freely available geospatial standards. Therefore, the OGC also has a major commitment to collaborate with other Standards Development Organizations (SDOs) that have requirements for using location based content. These SDOs include such organizations as ISO¹, OASIS², the IETF³, NENA⁴, OMA⁵ and the W3C⁶.

OGC Web Services: A Short History

The OGC Membership began exploring the concept and implementation of web services back in 1997 (Gardels 1997, Doyle 1997). These early discussions led to a new type of activity in the OGC – interoperability test beds and the development of the first OGC web service standard. The Web Mapping Test bed Phase 1 (WMT-1) was OGC’s first Interoperability Initiative and marks an important milestone in the history of geoprocessing. Results of the pilot projects were demonstrated in September 1999, and a second phase of pilot projects ended in April 2000.

WMT-1 yielded interface prototypes vendors used to enable users to immediately overlay and operate on views of thematic map data on the web from different online sources (subject to limitations of the data), regardless of which vendor’s software was serving that data. These prototypes ultimately resulted in the OGC Web Map Server Standard (OGC 2000). Also, the Geography Markup Language (GML), OGC’s standard system for XML encoding of geographic features, was prototyped in WMT-1.

Interestingly enough, the term “Web service” did not gain any extended usage until about the year 2000. The OGC Membership was quick to pick up the concept and developed an OGC white paper on the topic in 2001 (Doyle and Reed). In 2001 terms, this paper outlined the OGC consensus

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