Providing accurate, timely weather information
The primary goal of the Next Generation Air Transportation System (NextGen) is to address and meet the rapidly changing needs of the United States aviation industry, including the ever-increasing demand for air traffic services. Providing accurate, timely weather information at the temporal and spatial scales required by aviation decision makers is a fundamental component of NextGen, as this will increase airspace capacity, optimize efficiency, and improve safety. Weather has a considerable impact on aviation operations. The acquisition, management, dissemination, and utilization of weather-related information and data will play a vital role in the success of NextGen. Therefore, exploring, identifying, and employing methods and techniques that will help facilitate the flow of operation-specific weather-related data and information to end users is critical.

The concept of 4-D Weather is at the core of NextGen. It will be implemented by the Federal Aviation Administration (FAA), which will field the Common Support Services – Weather (CSS-Wx) System and the National Weather Service which will field the 4-D Weather Data Cube. CSS-Wx and the 4-D Weather Data Cube will work together to supply aviation users with information and will comprise weather data from disparate data contributors and locations. From CSS-Wx and the Cube, end users (e.g., air traffic managers, pilots, etc.) will be able to obtain a common weather picture of the National Airspace System (NAS).

Together the CSS-Wx System and the 4-D Weather Data Cube will provide a virtual repository of weather data from disparate data contributors and locations to provide end users with a common weather picture.

The CSS-Wx project is dedicated to using and developing technologies and standards for NextGen that will support effective dissemination of weather data. The National Center for Atmospheric Research/Research Applications Laboratory (NCAR), through support from the FAA and in cooperation with the National Oceanic and Atmospheric Administration/Global Systems Division (NOAA/GSD) and the Massachusetts Institute of Technology/Lincoln Laboratory (MIT/LL), has worked to create a foundation for NextGen weather data distribution.

The following strategies have been adopted for developing this capability:

- Develop a comprehensive understanding of the needs and requirements of National Airspace System (NAS) decision makers, as they relate to weather data dissemination
- Utilize a Service Oriented Architecture (SOA) to generate a flexible, efficient approach for the delivery of weather-related data, products and services
- Explore and adopt open standards and specifications that meet NextGen weather data requirements
- Participate in national and international standards bodies (e.g., Open Geospatial Consortium)
- Develop a systematic, extensible implementation approach that will support additional capabilities, services, data, and products as they come online.

CSS-Wx will be built upon a SOA to enable effective, efficient opportunities for data dissemination. SOA integrates

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The primary objective of CSS-Wx is to provide flexible, scalable open architecture and standards that will enable the seamless aggregation of data and services to support weather data discovery and acquisition by NAS decision makers.

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