4.2 DISSEMINATION AND UTILIZATION OF NEXRAD DATA IN THE UNIDATA COMMUNITY

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1. INTRODUCTION

The wealth of information available in the form of NEXRAD radar data and products provides interesting challenges in their widespread distribution and utilization within the university community. With product time scales on the order of five minutes, the number and volume of NEXRAD products that must be delivered presents formidable obstacles in the realm of competitive bandwidth considerations. The ability to deliver the increasing volume of data is paramount to the successful integration of these products into teaching and research activities.

2. THE INTERNET DATA DELIVERY (IDD) SYSTEM

Unidata currently provides redistribution of NEXRAD Level III data received via NOAAPORT to the university community over the Internet using the Local Data Manager (LDM) software. The necessity to deliver the large number of available Level III products to a broad user community led to significant improvements in the LDM software to efficiently store and retrieve the data. These improvements have led to more widespread use of NEXRAD data at universities as more sites are capable of handling the data stream which currently ranges from 120 to 200 Megabytes per hour.

Unidata, in collaboration with the University of Oklahoma and University of Washington, is leveraging the Local Data Manager software to deliver NEXRAD Level II data in near real-time in a project called CRAFT (Collaborative Radar Acquisition Field Test). Through CRAFT, many opportunities exist to explore the use of Level II data in model data assimilation schemes, 3-D visualization, quantitative precipitation estimation, hazardous weather warnings, as well as the development of new paradigms in storm formation for research and education. By enabling greater access to Level II data, the stage is set for vastly improved tools for analysis, display, and integration. At present, data is being distributed from 37 NEXRAD sites.

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3. A DIVERSE COMMUNITY OF USERS

In the past, the products comprising the largest data volumes in the IDD data streams (model & satellite imagery) were broadly applicable to most recipients throughout the data delivery system. However, with the focus of NEXRAD products toward regional interest, the emphasis on timely arrival of localized products becomes more complex. With fewer sites available to relay the full content of the data stream, automated topology design for the IDD is becoming more important. Many sites want full time access to their local radars, but at the same time, want on demand access to any location where active weather may be occurring.

One solution to provide access on demand to data has been client-server access using mechanisms such as the McIDAS Abstract Data Distribution Environment (ADDE). Using ADDE, sites can connect to remote data servers which provide access to the complete set of radars thereby eliminating the need to receive and house all data locally. This approach has also been successfully employed in platform independent software development using Java thus allowing for greater access by students at any level.

Another mechanism for delivering radar data where active whether is occurring are the IDD floater sites maintained by community members. The selection of radar sites which are considered of wide interest is updated routinely and maintained by interested students and researchers.

4. ADDITIONAL DEVELOPMENT

Analysis and display capabilities for the use of radar data in research and education have seen major developments, and techniques used in compositing real-time data from multiple sites and

incorporating data from other data sources to produce additional products have been developed. At present, several full resolution NEXRAD composite products are being created from the full set of Level III products. With the availability of composite products, sites may choose not to receive the full set of individual radars. Moreover, by integrating data from other sources, such as model output, additional information can be obtained from the observations. With access to the full volume scans of data, three dimensional display and analysis tools can combine the individual radar tilts into display which can be rotated and observed from any viewpoint.