

WSR-88D Data Status And Plans

Michael Istok

NWS Office of Science & Technology
and

Tim Crum

WSR-88D Radar Operations Center

27 January 2011

National Weather Service

Family Of Services/Partners Meeting

Seattle, WA



1/27/2011 FOS Meeting





Outline



- WSR-88D Program Schedule and Plans
- WSR-88D Level II Data Plans and Impacts
- Level II Refresh
- User Feedback and Q&A



WSR-88D Program Plans



- **RPG Build 12.2 (April Release)**
 - **Security updates**
 - **Field Test of 2D Velocity Dealiasing Algorithm (late summer 2011)**

- **AVSET**
 - **Ends volume scan if high elevation reflectivity data is insignificant**
 - **Can increase single site throughput up to 28%, but worst case by only 5% since worst case weather usually has significant reflectivity data on most tilts**
 - **Field Test in progress through May 2011**
 - 10 Sites: KTLX, KMLB, KGLD, KIND, KPUB, KMSX, KLWX, KCCX, KGGW, KEMX
 - **Deployment with Build 13 is planned, with successful field test: increases network throughput up to 9%**



WSR-88D Program Plans



- **Dual Polarization**
 - **RPG Build 12.1 and RDA Build 12.0**
 - **Clutter Mitigation Detection (CMD) algorithm not included in initial Dual Pol software release**
 - **Beta Test installs at five sites Spring 2011**
 - **Deployment to remaining sites Summer 2011 to 2013**
 - **Plan 12-day installation, no data**
 - Dual Pol Level II data distribution begins as sites return to operation
 - Add Dual Pol Level III product distribution the following week



WSR-88D Program Plans

- Build 13
 - **RPG deployment begins April 2012 with beta in February**
 - AVSET (assuming successful field test)
 - CR/35-38, ET/41, VIL/57, APR/67, LRM/65-66&90 products to report top elevation
 - 2D Velocity Dealiasing Algorithm (assuming successful field test)
 - **RDA deployment begins June 2012 with beta in April**
 - Deploys to Dual Pol RDA sites within 30 days of upgrade
 - Merge RDA software baselines (Dual Pol with Build 11.x)
 - Re-enables CMD and AVSET
- Add remaining 8 CONUS DoD sites to Level II network (Summer 2011)
 - **Bandwidth will support transmitting full resolution data**
 - **Increase network throughput by 6.2%**
- Envisioned Level II state at the end of Dual Pol
 - **147 WSR-88Ds: 142 sending version 6, and 5 sending version 4**
 - **Single site throughput 45 to 436 kilo bits/second (hourly avg)**
 - **Network throughput 1.8 to 19.8 mega bits/second (hourly avg)**



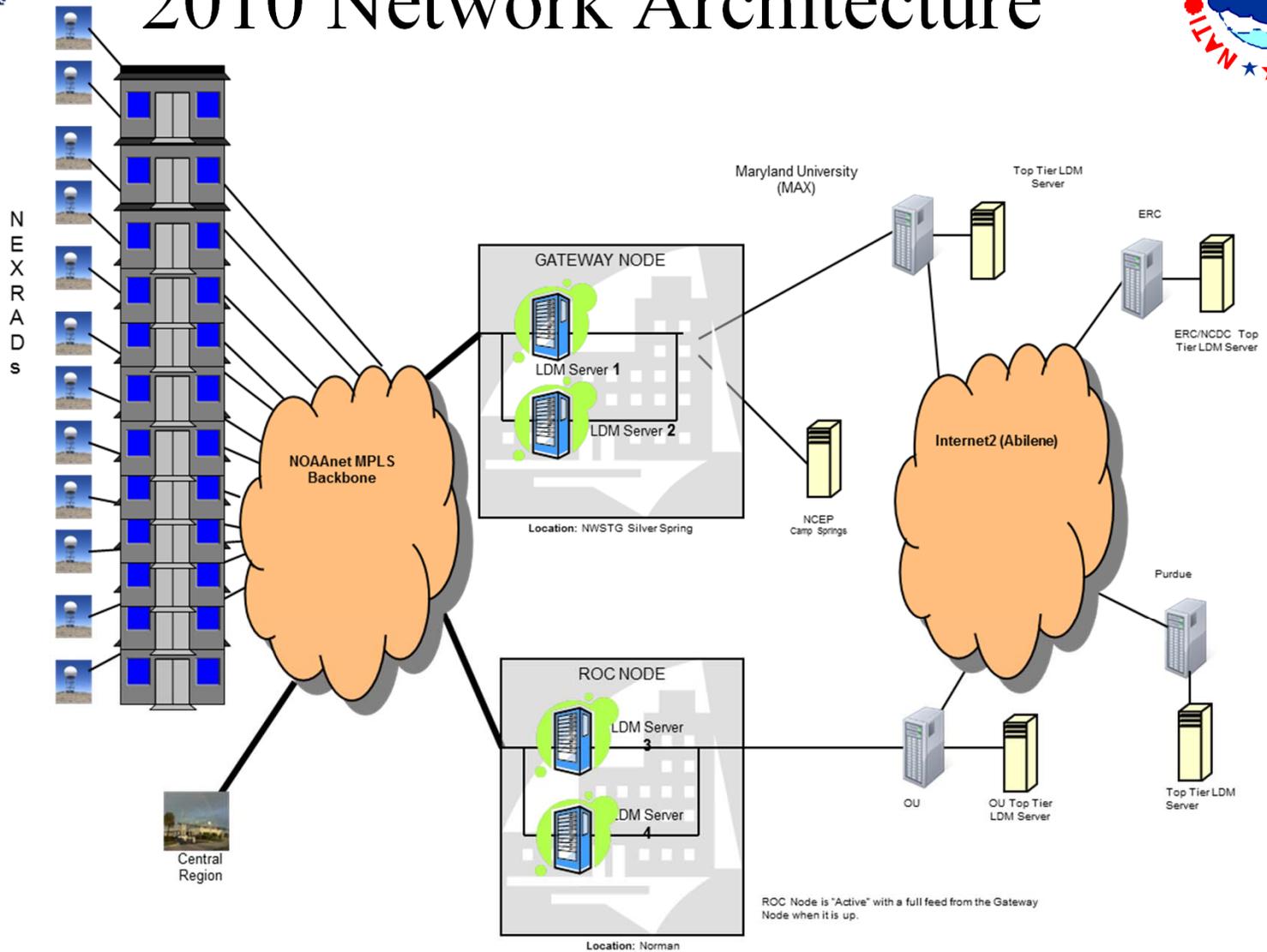
Level II Network Refresh



- In 2010 NWS “Refreshed” Level II network architecture
 - **Replaced IT equipment at end of serviceable life**
 - **Uses OPSnet communications and two national-level points providing 24/7 network support**
 - Auto failover within 5 minutes of detected server or network failure
 - Regional servers removed
 - **Uses Same Top Tiers**
 - **Eliminated “region-wide” outages**
 - **Provides more reliable Level II data delivery**



2010 Network Architecture





User Feedback and Q&A



- NWS to develop a process for considering external/partner input for data and products collected and distributed (e.g., added TDWR-SPG products)
 - **Assess impacts of increased data load**
 - **Gather initial feedback from external users on prioritization of the requests**
 - **Propose a solution**
 - **Gather comments on the proposed solution from the user community/partners**
 - **Your initial feedback, to this plan, now please**
- Your feedback on the Level II Network Refresh Architecture
- Your feedback on any radar topic

Supplemental Slides



WSR-88D Program Plans

- **Dual Polarization (RPG Build 12.1 and RDA Build 12.0 (contractor delivered))**
 - **To begin during Beta Test**
 - **New data versions 5, 6, 7 to indicate variations of Dual Pol data**
 - **Transmit version 6 (full resolution) from all NWS WSR-88Ds, CONUS DoD, and 1 FAA radar (Puerto Rico)**
 - Single site and network throughput will increase 130% (factor of 2.3)
 - **Remove Dual Pol data and recombine base moments from sites where bandwidth is constrained (e.g., version 4 from Hawaii)**
 - **Version 5 used if 1/2 degree azimuth sampling is disabled which is identical in format, resolution, and size to version 7**
 - Expect rare use (e.g., emergency satellite backup RDA/RPG link)
 - Level II collection radar site communication limitations
 - Increase single site throughput up to 70% (factor of 1.7)
 - **Software to process Dual Pol Level II data available at**
 - www.weather.gov/code88D



Versions of Level II Data

- Starting in RPG Build 12.1, RDA will always provide
 - Reflectivity data at 250 meter range resolution
 - Velocity and Spectrum Width to 300 km max range (< 70 kft altitude)
- Version numbers indicate type of data
 - Version 3 changes with RPG Build 12.1
- Plan for Dual Pol
 - NWS and CONUS DoD WSR-88Ds to provide version 6
 - FAA WSR-88Ds to provide version 4 (TJUA to send version 6)
 - Other Versions in special cases
- Degraded data characteristics driven by NWS comms funding availability

Pre-Dual Pol Super-Res	Recombined and delete Dual Pol	Dual Pol w/ Super-Res Disabled	Dual Pol w/ Super-Res Enabled	Recombined Dual Pol
------------------------	--------------------------------	--------------------------------	-------------------------------	---------------------

#	Data Characteristic	RDA Super Res Control		Level II Version Number				
		Disabled	Enabled	3	4	5	6	7
1	Azimuthal resolution on split cuts (deg)	1	0.5	0.5	1	1	0.5	1
2	Azimuthal resolution on batch and above cuts (deg)	1	1	1	1	1	1	1
3	Reflectivity range resolution on split cuts (m)	250	250	250	1000	250	250	250
4	Reflectivity range resolution of batch and above cuts (m)	250	250	1000*	1000	250	250	250
5	Reflectivity data included on Doppler split cuts	No	Yes	Yes	No	No	Yes	No
6	Doppler data to 300 km	Yes	Yes	Yes	No	Yes	Yes	Yes
9	Dual pol data included	Yes	Yes	No	No	Yes	Yes	Yes
7	Dual pol data at 250m range resolution	Yes	Yes	na	na	Yes	Yes	Yes
8	Dual pol data to 300km range	Yes	Yes	na	na	Yes	Yes	Yes
		RDA/RPG Link		LDM Level II				
Volume Average Worst Case Throughput (kbps)		3:1 Compression		4.1:1 Compression				
VCP 12		358	502	158	80	231	329	231
VCP121		250	389	174	80	156	249	156
Allocation		512	768	384	128	384	512	384



WSR-88D Data and Product User Support



- **Dual Polarization Information**
 - **Project status and schedules**
 - **Dual Pol sample data/products, and Interface Control Documents**
 - **<http://www.roc.noaa.gov/WSR88D/DualPol/Default.aspx>**
- **Level III products and Interface Control Documents**
 - **Higher Resolution Level III product samples**
 - **http://www.roc.noaa.gov/WSR88D/Level_III/Level3Info.aspx**
- **Common Operations and Development Environment (CODE) for Dual Polarization (RPG Build 12.1)**
 - **<http://www.weather.gov/CODE88D>**



Additional Information

- Real-time Dual Pol and Build 12.1 Level II Test Data available
 - **Data may not be continuous or of optimum quality since in test mode**
 - **Data will be part of regular Level II LDM data stream**
 - Dual Pol available now as KOUN
 - Build 12.1 KCRI data is available now as FOP1, DOP1, DAN1, ROP3, ROP4, NOP3, or NOP4 (ICAO depends on radar configuration)
 - **Will become pre-Dual Pol Build 12.1 in August**
- Many changes in Level II Data, Level III products, Dual Pol, more sites on network, higher-resolution data, etc. underway:
 - **Please keep checking for NWS TINs and PNSs**
 - **ROC web site contains TINs, PNSs, additional information**
 - <http://www.roc.noaa.gov/WSR88D/>



Additional Information

- Project updates and other Level II information:
 - http://www.roc.noaa.gov/WSR88D/Level_II/Level2Info.aspx
- NWS Real-Time Level II Data Monitoring Site:
 - <http://weather.noaa.gov/monitor/radar2/>
- NWS Real-Time Level III Product Site Status:
 - <http://weather.noaa.gov/monitor/radar3/>
- NWS RPCCDS Information for product users:
 - <http://www.nws.noaa.gov/tg/rpcdds.html>
- Build specific training materials:
 - <http://www.wdtb.noaa.gov/>



Additional Information

- NCDC Radar Resources: Order Level II and Level III Archive Data Via FTP, Use NCDC Java Viewer to View Level II and Level III Archive Data, etc.
 - <http://www.ncdc.noaa.gov/oa/radar/radarresources.html>
- Run RPG Software, LINUX Platform: The Common Operations and Development Environment (CODE)
 - <http://www.weather.gov/CODE88D>
- Federal Meteorological Handbook No. 11 (FMH-11) Part A Updated for Build 12.1 available electronically at:
 - <http://www.roc.noaa.gov/WSR88D/> under “**WSR-88D Program**”
- Follow-up questions to: Michael.Istok@noaa.gov or Tim.D.Crum@noaa.gov