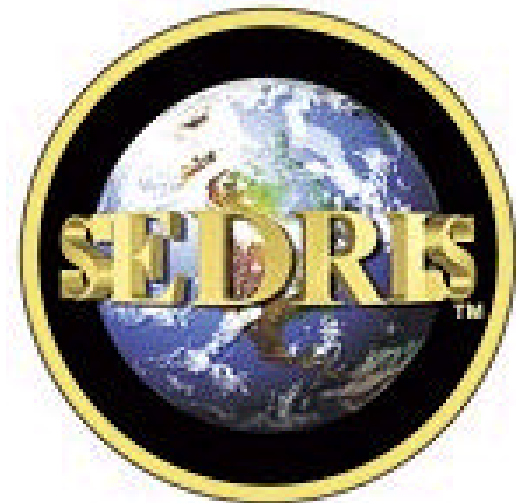


CTDB Conversions

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Topics

- CTDB Format Basics and Issues
- CTDB Conversion Tools Overview
- CTDB Conversion Tools Usage
- Summary



CTDB Format Basics

- Compact Terrain Database (CTDB) is highly compact terrain representation format used in JointSAF/ModSAF/OneSAF Testbed Computer Generated Forces (CGF)
- CTDB is composed of the following:
 - Terrain skin (Grid-ed or TIN-ed)
 - Physical Features
 - Trees, canopies, laid-linears (roads & rivers)
 - Volume models
 - Multi-Elevation Structures
 - Abstract Features
 - Areal feature boundaries (tree canopies, lakes, soil areas)
 - Railroads, pipelines, etc.
 - Polygon Attribute Table (PAT)



CTDB Issues

- There are little and big endian versions of CTDB (.c7l and .c7b).
- CTDB creation process is difficult.
 - Errors in databases crop up often:
 - T-vertices, for example.
- Not many CTDB verification and validation tools other than the SAF programs.
- No easy to use tools to modify existing databases.



CTDB to STF Overview

- CTDB to STF is an application that converts CTDBs into STF.
 - Converts big-endian CTDBs on big-endian architectures and vice-versa.
- CTDB to STF maintains in the STF the following CTDB data elements:
 - PAT (Poly gon Attribute Table)
 - Elevation and Soil Grid
 - TIN (Triangular Irregular Network)
 - Physical Features (Trees, Tree Lines, Canopies, Laid Linears, Volume Models, MESs, Microterrain)
 - Abstract Features
- Supports AUTM and GCS CTDBs.
- Supports Geometric and/or Feature Representations of the CTDB Terrain Features in the generated STF.



CTDB to STF current status

- Version 0.5 released on December 2nd, 2003.
 - Creates SEDRI release 3.1 compliant STFs.
 - Derives geometric representations of CTDB linears, laid linears and volume models.
 - Derives polygonal representation of the CTDB elevation and soil grid.
 - Supports the conversion of multi-cell GCS CTDBs (old-style GCS and GTRS).
 - EDCS 2.9 and FACC code conversion.
 - Supports the quad-tree structure of CTDB Abstract Features.
 - Supports Windows, Linux, SGI and Sun platforms.



STF to CTDB Overview

- STF to CTDB is an application that converts an STF into CTDB.
 - Creates little-endian CTDBs on little-endian architectures and vice versa.
- STF to CTDB can create many CTDB data elements from properly attributed DRM objects:
 - Roads and Rivers with network information.
 - Trees, Tree-lines, and Canopies.
 - Volume models
 - More (see STF to CTDB documentation for a complete list)
- Creates format 7 CTDBs:
 - SIMNET
 - GCS single-cell and multi-cell
 - GTRS
- Using the SEDRIS SRM, can convert STFs that are in the UTM, GD, TM, and GCS spatial reference frames into CTDB.



STF to CTDB Current Status

- Version 0.9 released on July 11th, 2003
 - Multi-cell GCS CTDB creation support added.
 - Many bug fixes and minor enhancements.



CTDB Conversion Tools Overview Summary

- Many details not covered during this brief presentation.
 - See the STC 2002 CTDB presentation which can be found on the SEDRI web site.
 - Goes into much more detail on the CTDB format and how to use both tools.
 - Also available on CD with a video of the presentation.
 - Download the CTDB to STF tool and see the CTDBtoSTF mapping document, which has a comprehensive mapping from the CTDB data format into STF.

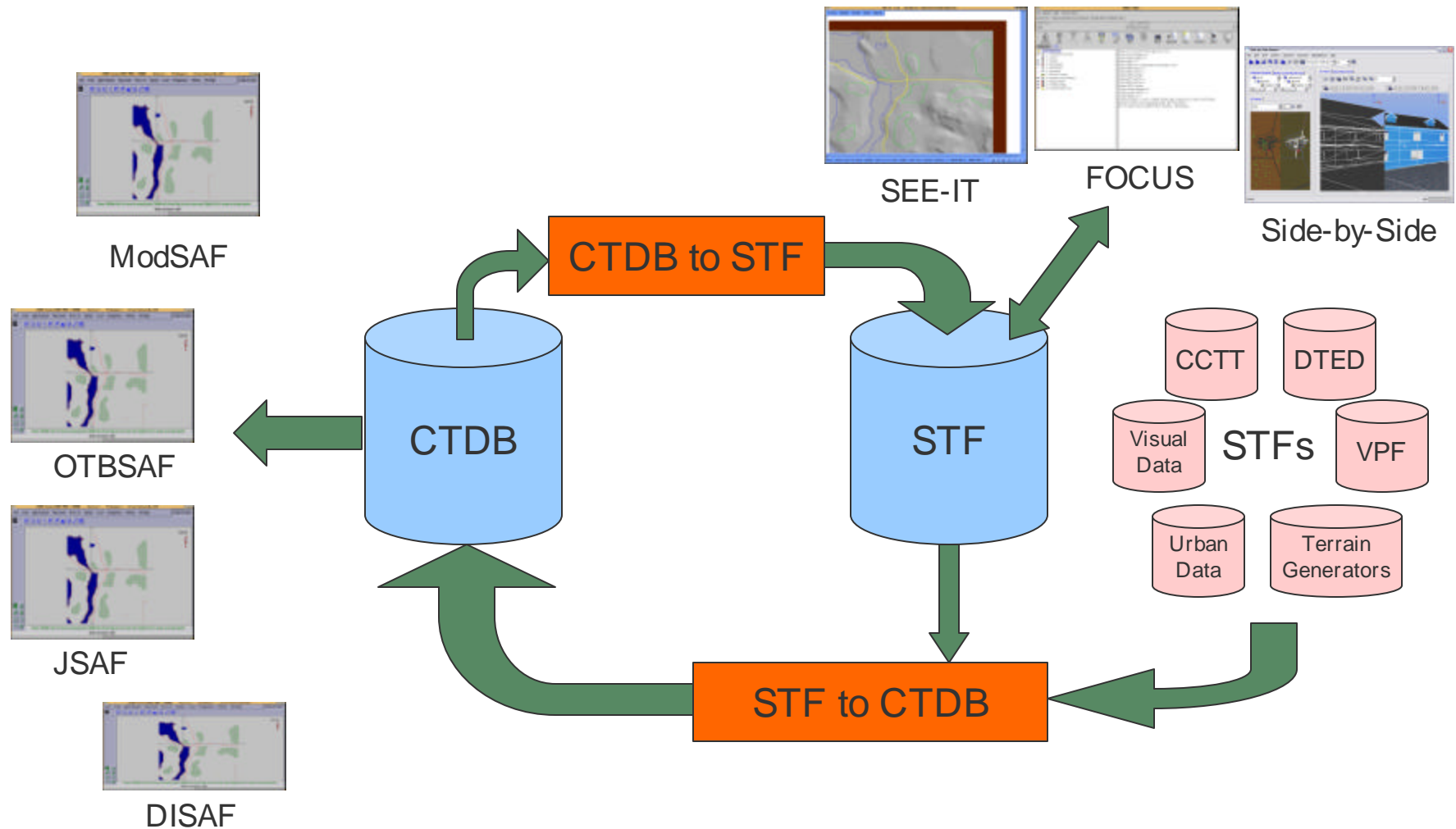


CTDB Conversion Tool Usage

- In combination, our CTDB conversion tools open up many possibilities:
 - Quickly get native data into CTDB.
 - Other database conversions.
 - CTDB testing and correction.
 - Visualizing CTDB data.
 - Leverage existing SEDRIIS data.



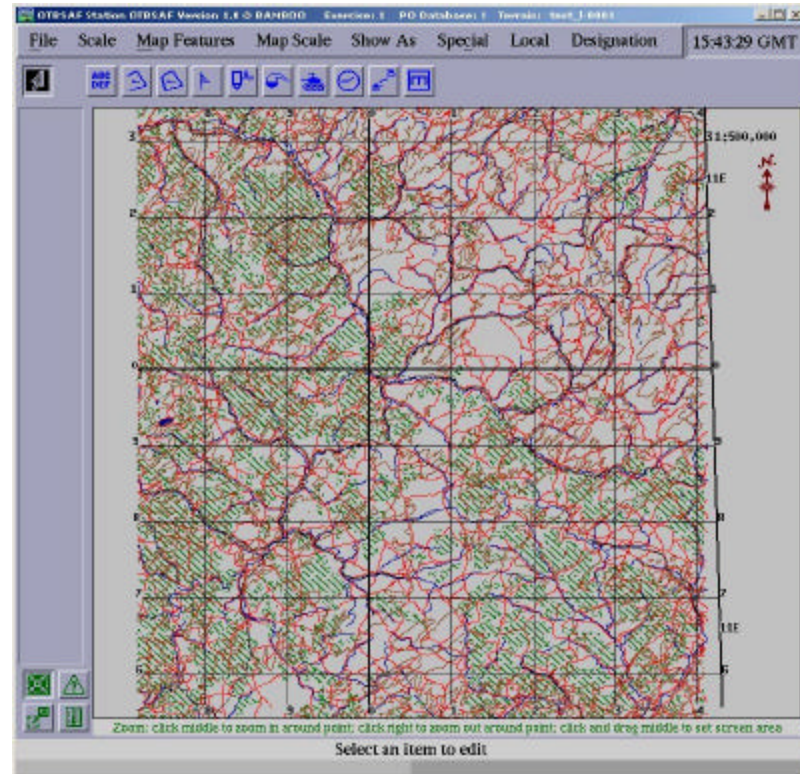
CTDB Conversion Tool Usage Diagram





Tool Usage – Native Data into CTDB

- Native VPF and DTED data covering the Earth is available through NGA.
- Convert the native data into SEDRIS using VPF to STF and DTED to STF.
- Value-add to VPF and DTED datasets using various SEDRIS tools.
- Take the created SEDRIS transmittals and convert them into CTDB using STF to CTDB.





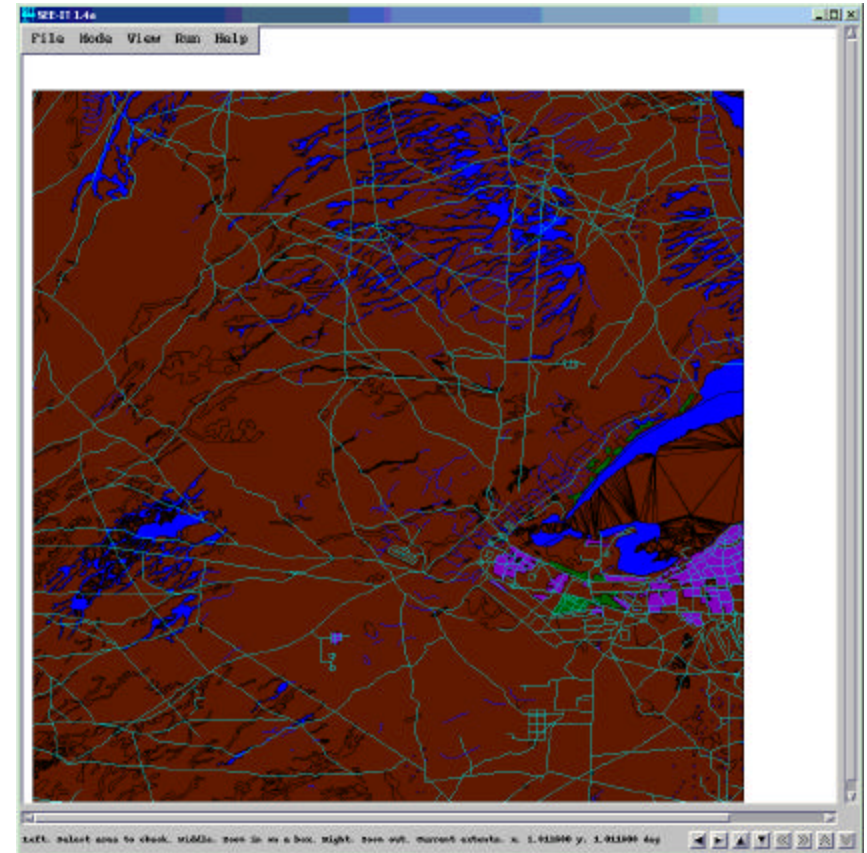
Tool Usage – Database conversions

- Have a format that you need to convert into CTDB?
 - Convert it to SEDRIS instead, using the STF to CTDB data expectations as a guideline for creating your transmittal.
 - Using the SEDRIS API is much easier than using CTDB Compiler API.
 - Convert it to CTDB using STF to CTDB.
 - Take advantage of SEDRIS tools and utilities to validate your data first and possibly find problems with your own databases.
 - Now you've achieved your goal AND have a converter that takes your native format into the standardized SEDRIS interchange format.



Tool Usage – CTDB Testing and Corrections

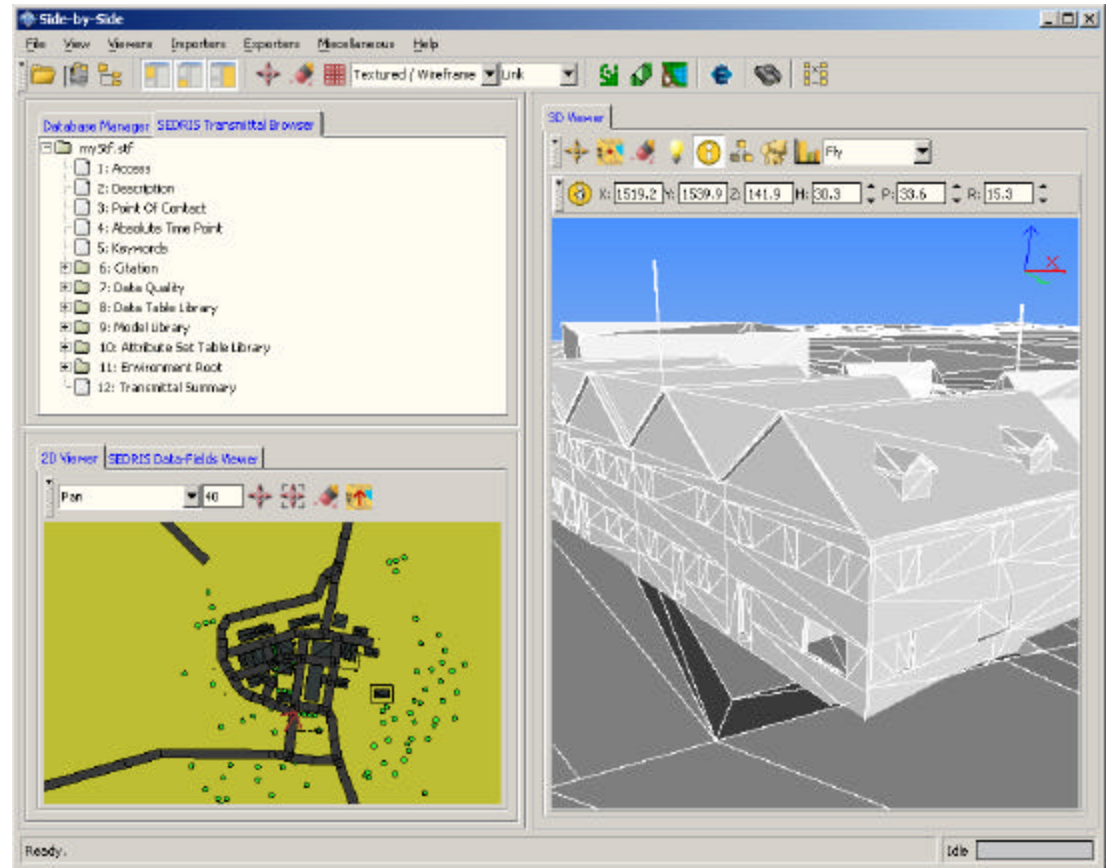
- Convert CTDB into SEDRIS using CTDBtoSTF.
- Using SEDRIS-based terrain testing tools to test the data:
 - SEE-IT to help identify data problems such as t-vertices and non-connected road linears.
 - Side-by-Side for visual inspection.
- Use existing SEDRIS tools (such as Focus) to make corrections to errors found in the SEDRIS transmittals
- Convert back to CTDB using STF to CTDB.





Tool Usage – Visualizing CTDB data

- Using CTDB to STF's “derived geometry” feature, you can produce a rough visual in STF from a CTDB.





Tool Usage – Leverage existing SEDRI data

- AcuSoft has modified the CCTT STFs such that they are compliant with the STFtoCTDB STF requirements.
- They are modified to convert the Fixed-List Polygonal Layers into a single terrain layer.
- The control links used in the CCTT STF are also removed.
- AcuSoft has used the STFtoCTDB compiler to successfully build CTDBs for 3 of the CCTT STFs.



Summary

- CTDB format is a widely used format, but it is difficult to create CTDBs and difficult to test and modify existing CTDBs.
- SEDRIIS has created two conversion tools, STF to CTDB and CTDB to STF, that help alleviate these problems and make the CTDB format easily accessible to somebody who isn't a so-call CTDB expert.