Latest Advances in the Antelope Environmental Monitoring System

- ***Antelope 5.14***

Dr. Kent Lindquist

CTO, Boulder Real Time Technologies, Inc.

June, 2024

Trieste, Italy AUG

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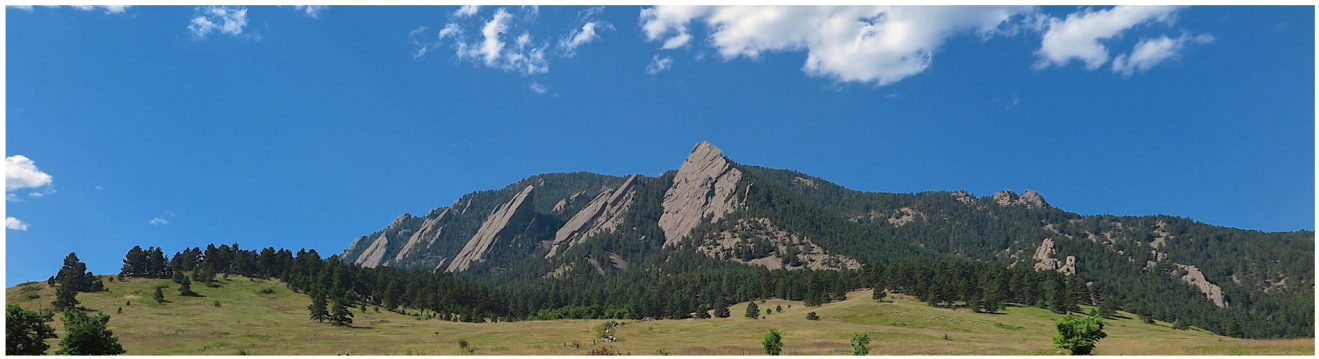
- Founded 1996
- Based in Boulder, Colorado, USA
- Makers of the ***Antelope*** *Environmental Monitoring System*



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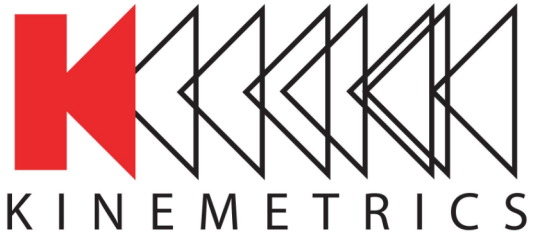
Thanks to Kinemetrics

Thanks to our long-time strategic partners, Kinemetrics, Inc.



Antelope Users' Group Meetings

- *Thanks to Giovanni Costa and SeisRaM / U. of Trieste!!*

UNIVERSITÀ DEGLI STUDI DI TRIESTE

- *European AUG Meetings definitely back on track*

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Antelope Users' Group Meetings

- *Looking forward to as rewarding a meeting as Vienna '23*

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Boulder, CO Local Snapshot (20 May 2023)

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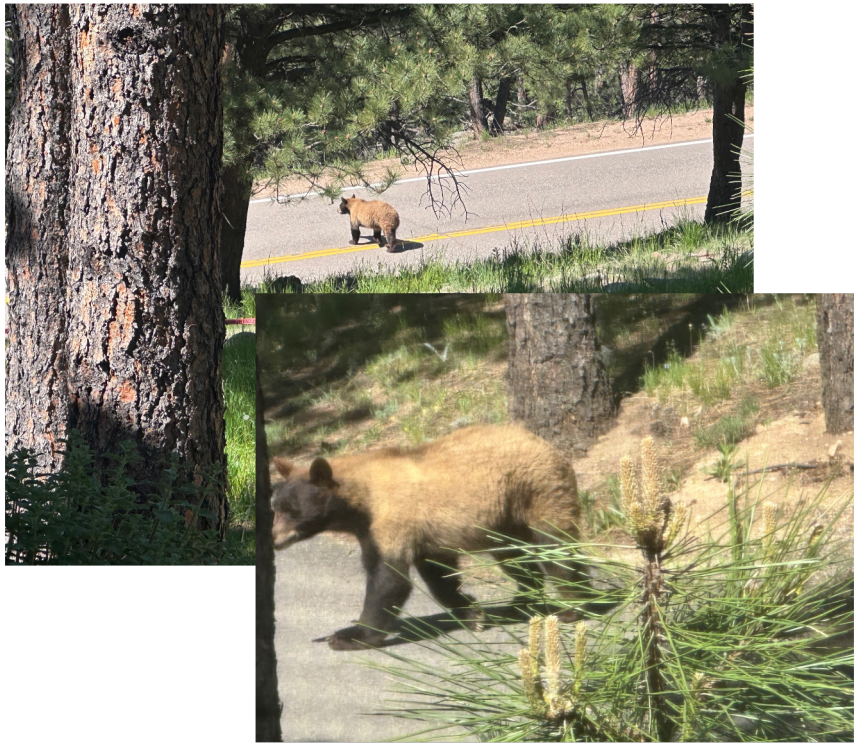
Boulder, CO Local Snapshot (28 May 2023)



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Outline

- Antelope 5.14
  - Platform Support
  - Interpreters
  - Antelope Contributed Code
    - ObsPy Support
    - MsPASS Panda DataFrames and Datascope
    - Status / discussion
  - Zendesk integration in BRTT Web Site
  - Node Package Manager in Thirdparty Code
  - Docker [5.13] now with VNC Support / GUIs [5.14]
  - Small Changes
  - Condor Structural Health Monitoring
  - New Developments: webdlmon, web tech stack, rtsystems on AWS
    - -> Leslie Pajuelo, Rohan Ambli

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Antelope 5.14 Platform Support

- Linux
  - CentOS / RHEL 7 (compiled on CentOS 7.9)
  - RHEL 8 (compiled on RHEL 8.6)
  - RHEL 9 (compiled on RHEL 9.3)
  - Ubuntu 22 (compiled on Ubuntu 22.04)
- macOS
  - Intel-architecture Monterey (compiled on Intel macOS 12.6.3)
  - ARM64-architecture Monterey (compiled on M1 macOS 12.2.1)

Antelope 5.14 Platform Support Changes

- RHEL 9 Added
- This is the last year for CentOS / RHEL 7
    - CentOS 7 End Of Life June 30, 2024
- macOS
    - Intel Support finite
        - Apple transition to ARM64 Silicon “complete” June, 2023
        - Apple Intel hardware “Vintage” 2028; “Obsolete” 2030
        - BRTT planning to support Intel macOS hopefully several more years
            - customer dependent
            - code-compilation dependent

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Antelope 5.14 Interpreters





- *Qt 5.15.8, Qt 6.3.2* (*Two versions, older for CentOS 7*)
- *Perl 5.38.2* (*Aiming to change each release, collision avoidance*)
- *TclTk 8.4.19* and *8.6.0* (*Same as previous Antelope versions. Dead language.*)
- *MATLAB R2024a* *(Finally, with native MATLAB for ARM64 macOS!)*
- *Python 3.12.2* (*Aiming to change each release, collision avoidance*)
  - *ObsPy* support preserved through ***install_obspy***(1) command

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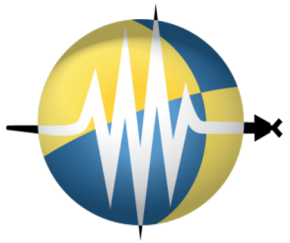
Contrib: ObsPy support



- *ObsPy*: Python Framework for Seismology
  - https://obspy.org
  - Gaining significant traction
- ***install_obspy***(1) command supported in Antelope
- Lots of effort this year to make sure Antelope Python is *ObsPy*-compatible
  - *ObsPy* is not our code – can't ship pre-built
  - Installation packages require compilers thus sysadmin dependent
  - Works with Antelope toolchains – workarounds for common problems documented in ***install_obspy***(1)
- Bring any problems to support@brtt.com – we want this to work for you

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Contrib: MsPASS Panda DataFrames - Datascope

- MsPASS:
  - Massive Parallel Analysis System for Seismologists
  - Open-source seismic data processing framework
  - https://mspass.org
- Gary Pavlis (U. Indiana) and Ian Wang (TACC)
- New “DatascopeDatabase” class:
  - Pandas DataFrame as intermediary between MsPASS, Datascope
  - DataFrame: Canonical way to handle tabular data in Python
- Converter docs at https://www.mspass.org/python_api/mspasspy.preprocessing.html

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Contrib: Status ? Community discussion

- Antelope Contributed Code stable in GitHub
  - https://github.com/antelopeusersgroup/antelope_contrib
- BRTT building tarballs of compiled contributed code for each release
- Open questions:
  - Who handles pull requests
  - Who handles merge of *master* into *brttnext* for inclusion in release
  - Future of the AUG web site – very stale: take down, or reinvigorate?

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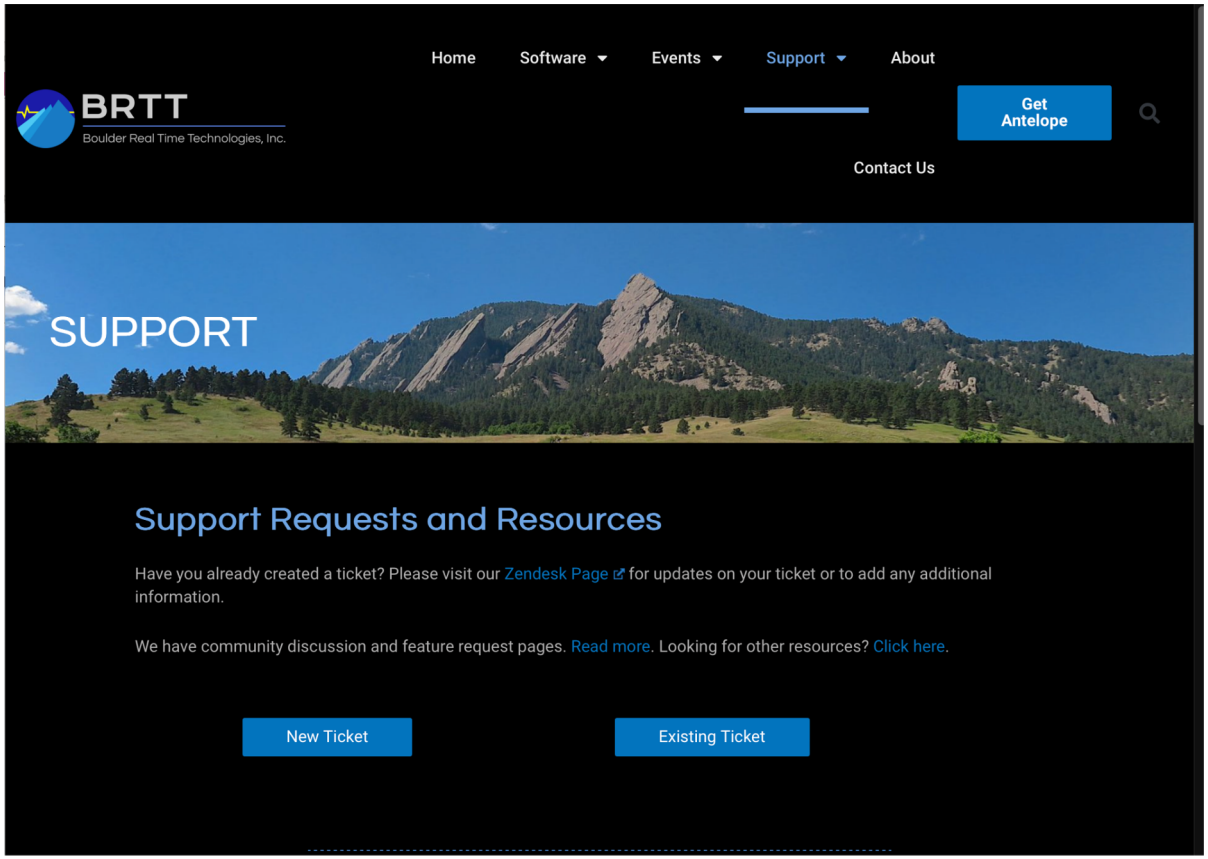
BRTT Web site – Zendesk integration



https://brtt.com/support

- Email to support@brtt.com remains the same
- New option to submit via https://brtt.com
- Includes link to existing tickets
- Fields for standard questions streamlines responses
- Feedback welcome

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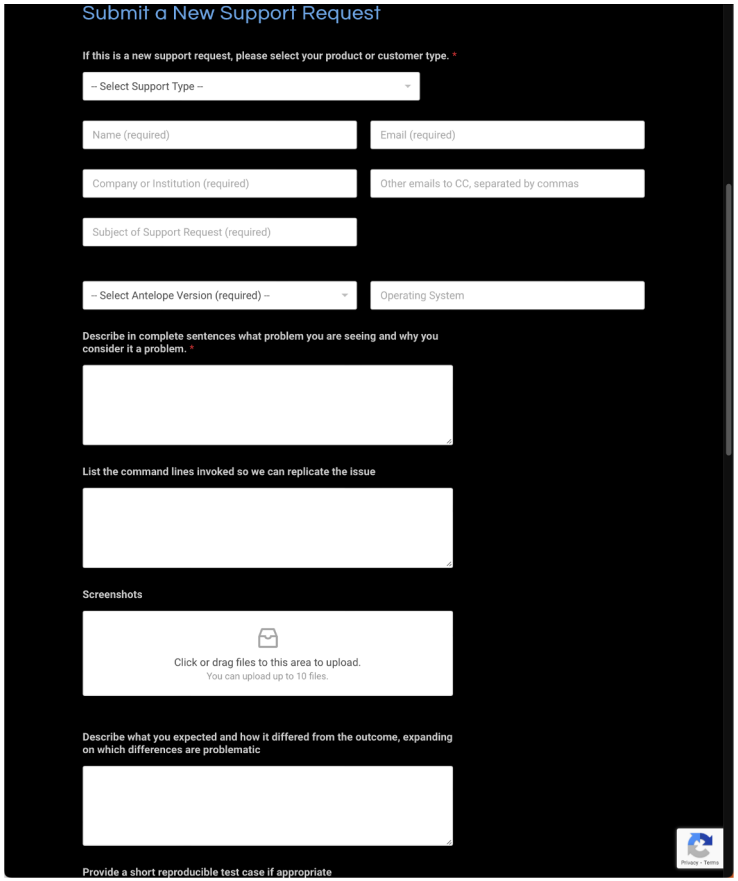
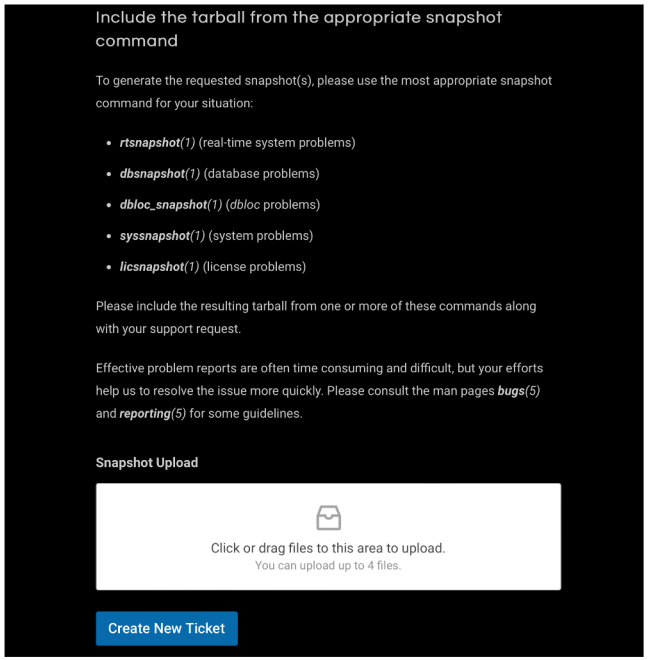
BRTT Web site – Zendesk integration

https://brtt.com/support





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Docker Containers: Added VNC Capability

- Antelope 5.13 Docker container was command-line / headless only
- Antelope 5.14 adds VNC capability to the docker image
  - Can port-forward full display then run Antelope GUI applications
- This is Not the way containerized applications are architected to work!
- Deliberate step ‘backwards’ in architecture to support the move to cloud for traditional Antelope operations
- Stepping stone with intent to engineer back towards headless nodes
- Multi-year evolution is towards lightweight microservices
- Further discussion in Rohan Ambli’s Kubernetes / Antelope talk

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Node Package Manager in Thirdparty code

- Repository for third-party code shipped with Antelope:
  - /opt/antelope/thirdparty/
- Initially contained
  - Openssl
  - Nginx
- Now includes
  - Node Package Manager (***node*** and ***npm***, for React Javascript code)
  - In support of ***webdlmon*** and related webapps

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Small Changes

- CSS3.0 Null Values
- ***dbe*** column widths

CSS3.0 Null Values

- Many missing null values added, per Gary Pavlis:
  - bestdc
  - mexpon
  - cdperr
  - claerr
  - cloerr
  - coterr
  - durat
  - dused
  - nrlpb
  - nrmw
  - nslpb
  - nsmw
  - tmnlpb
  - tmnmw
  - dip
  - mfferr
  - mrferr
  - mrrerr
  - mrterr
  - mtferr
  - mtterr
  - val1
  - val2

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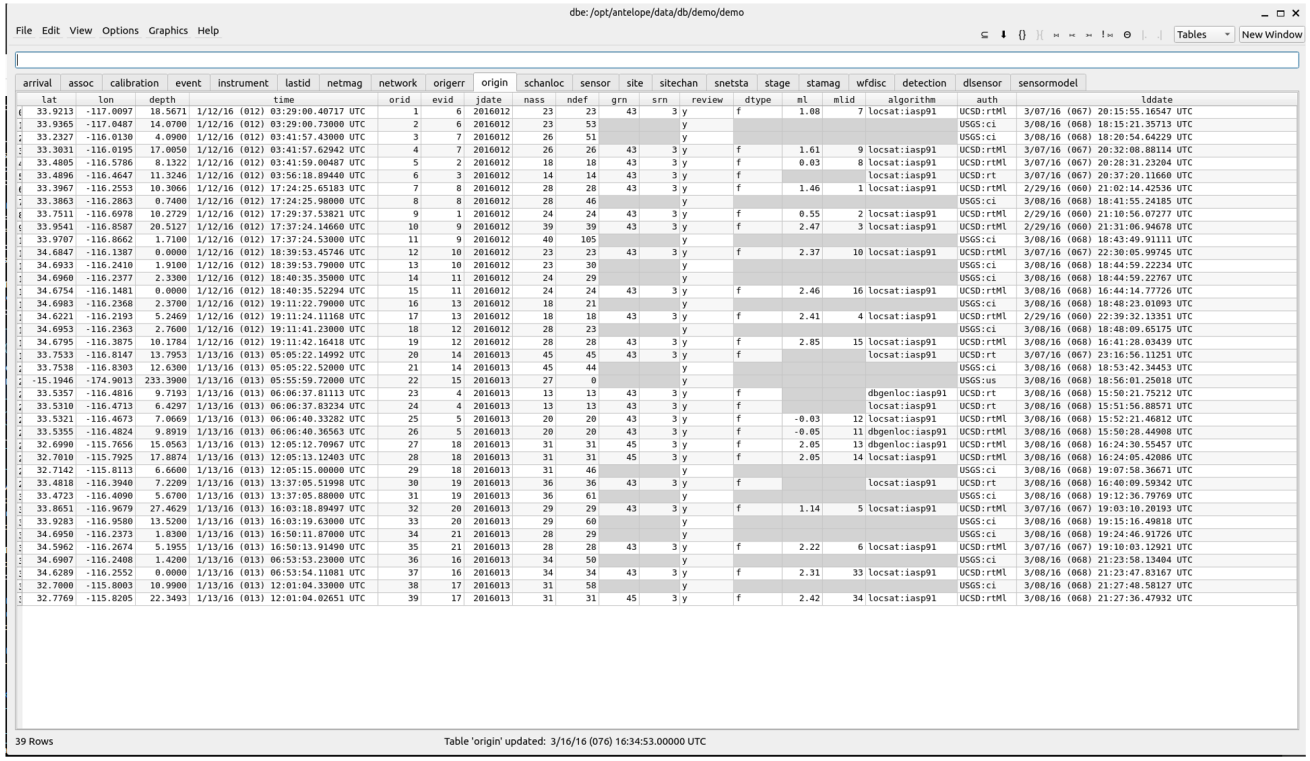
dbe column widths



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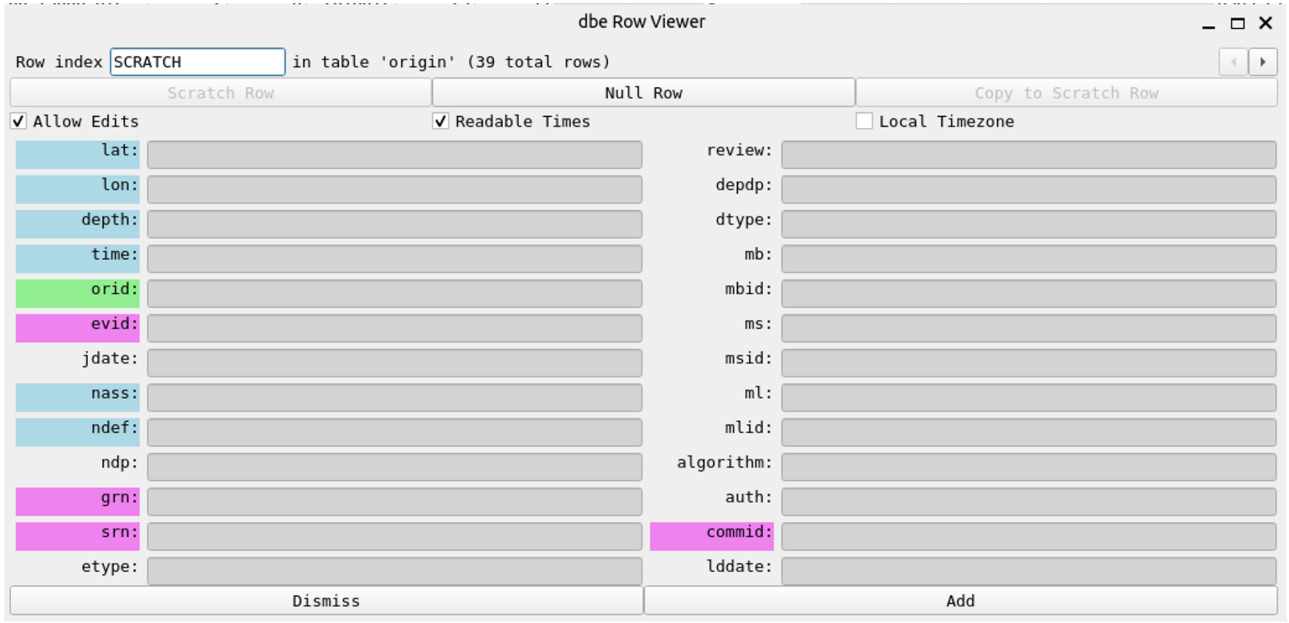
dbe row-editor field names



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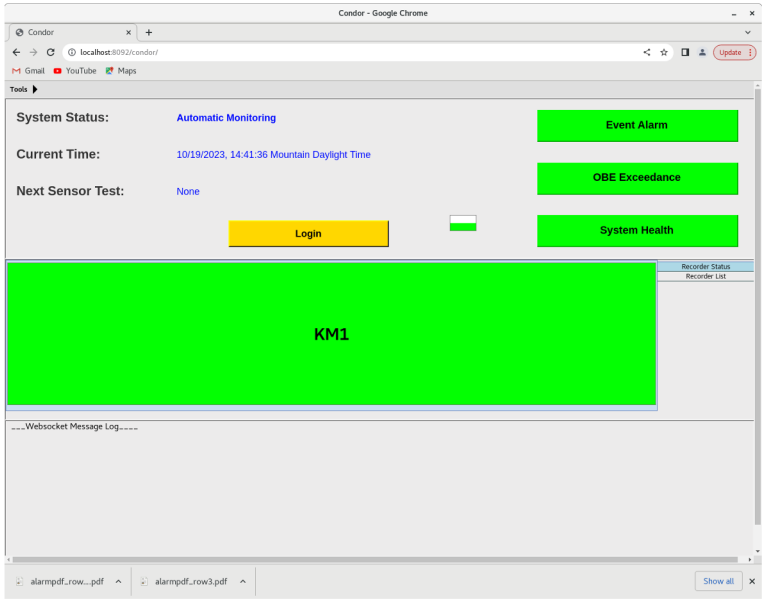
Condor

https://kinemetrics.com/post_products/condor2/



- Condor2: Earthquake Monitoring Solution for the Power Generation Industry
- Re-implemented underpinnings with Antelope Docker and Bighorn real-time system
- Currently same User Interface design for continuity
- Numerous options for future enhancements

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Big new developments

- **webdlmon** and Antelope web tech stack: ***Leslie Pajuelo***

- AWS Cloud real-time systems: ***Rohan Ambli***

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Coming Development Year

- Composable Web Object development
  - webdlmon sophistication
  - dbevents
- Smoothing cloud-compute workflows and rtsystem deployment
- List of small improvements
- Requests? Suggestions?

Antelope is the product it is today because of our users, your needs and feedback.

We look forward to continuing to support you.

Bring us your ideas!

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Obtaining Antelope

- Evaluation copies, subscriptions or upgrades to Antelope 5.14:
  - Contact Kinemetrics, Inc.:
    - ***sales@kmi.com***

- Technical questions about Antelope:
  - Contact BRTT:
    - ***support@brtt.com***

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Thank You

support@brtt.com