DIGITAL MAPPING TECHNIQUES 2022

The following was presented at DMT'22
May 22 - 25, 2022

The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2022)

http://ngmdb.usgs.gov/info/dmt/

AK DGGS' Hardware Solution for Collaborative Field Data Collection

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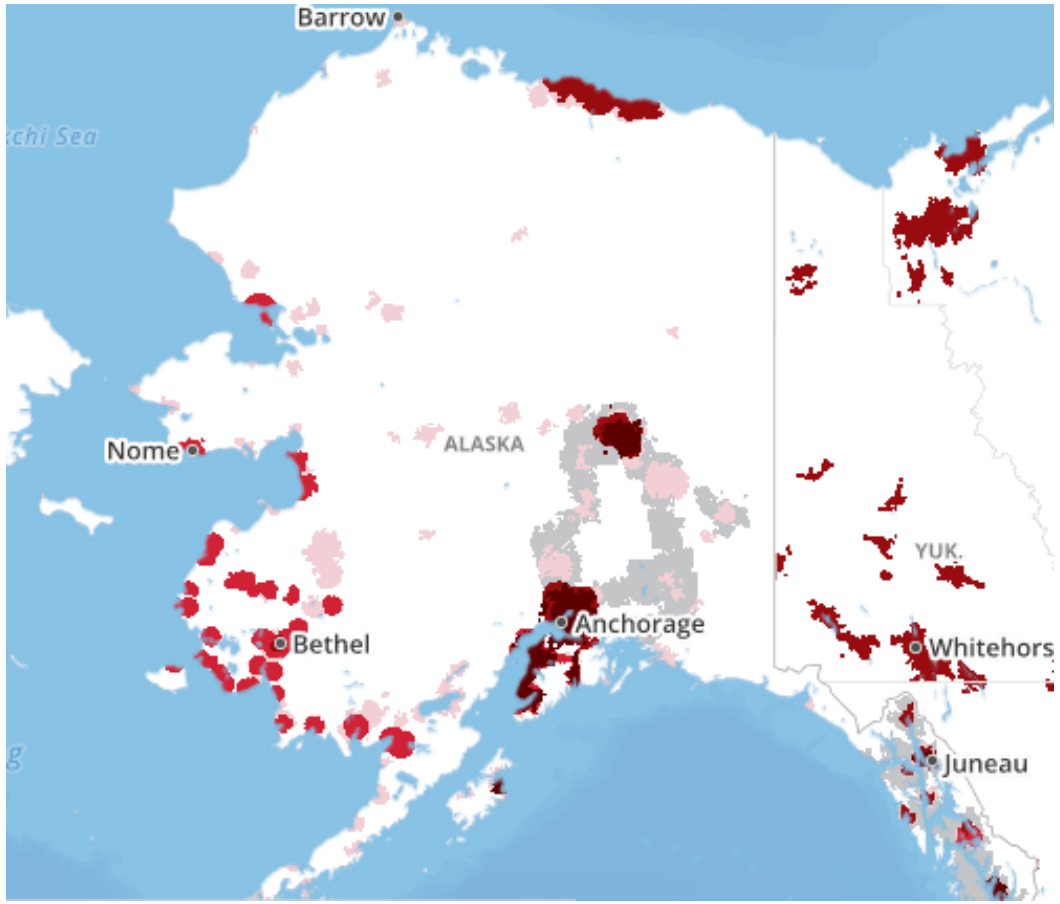
Collecting Field Data in Alaska



GCI cell phone coverage map from whistleout.com

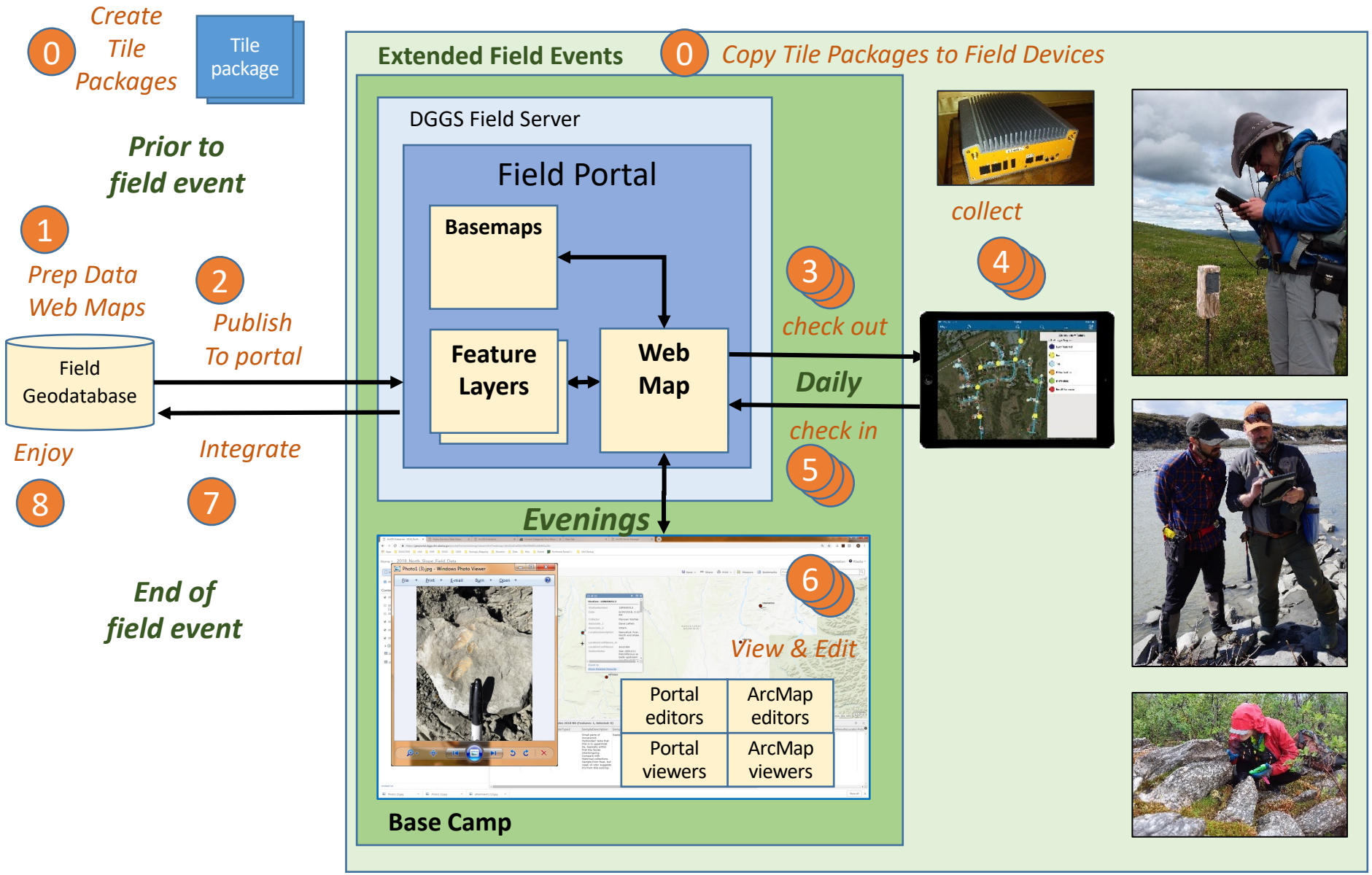
Data Collectors' Needs:

- Online ArcGIS Enterprise geoportal
- Support various handheld wireless devices
- Allow for uploading new data daily
- Allow for sharing data among multiple people

Significant Challenges:

- Remote locations with very limited internet access and cell phone coverage
- Lots of dust and dirt

Field Geology Support System - 2022

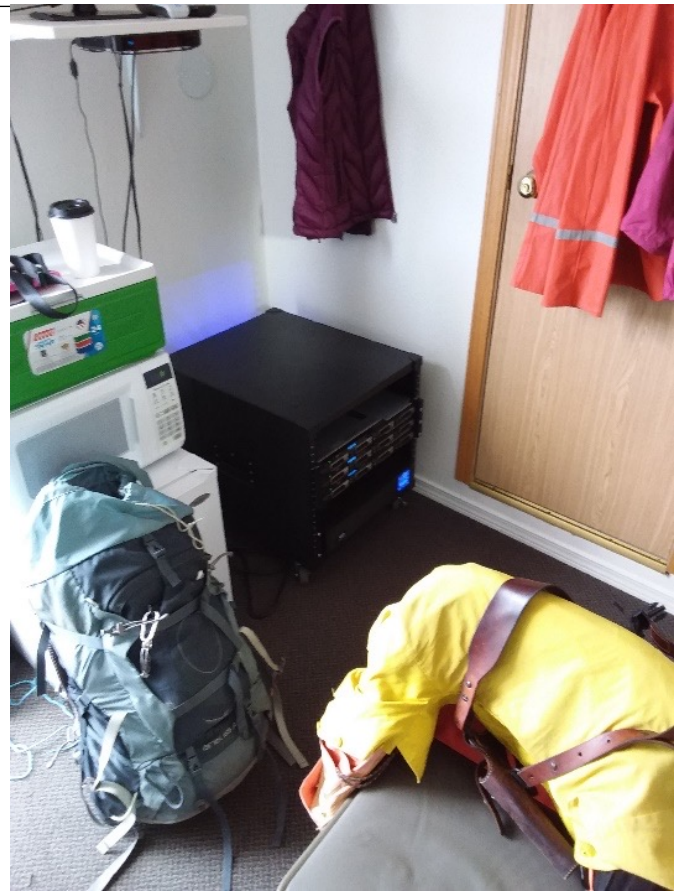


Solution: “field portal”

(first iterations)

- Fully Functioning Unit
- Redundant Hardware
- Robust
- Meets the need

- Expensive
- Heavy
- Many components introducing opportunity for failure
- Vulnerable to dust/dirt



Better Solution!

- Onlogic.com Industrial Mini-ITX ML500
- Intel i7 2.4 GHz Processor, 32GB RAM, 1TB disk storage
- Hosts ArcGIS Enterprise (server+portal+datastore)

Cool Features

- **Fanless! No moving parts**
- **8x8” and 8lbs, fits in a backpack or pelican case**
- **Display Port, RJ45, USB, with plugs to keep dust out**
- **Wireless Access Point**
  - **Wireless chip from EmbeddedWorks.net**
    SparkLAN WNFQ-258ACN(BT) 802.11ac/abgn
    + Bluetooth M.2 (NGFF) Module | Qualcomm QCA6174A-5
- **More Affordable**
- **Conventional 110volt power adapter**

Software Stack

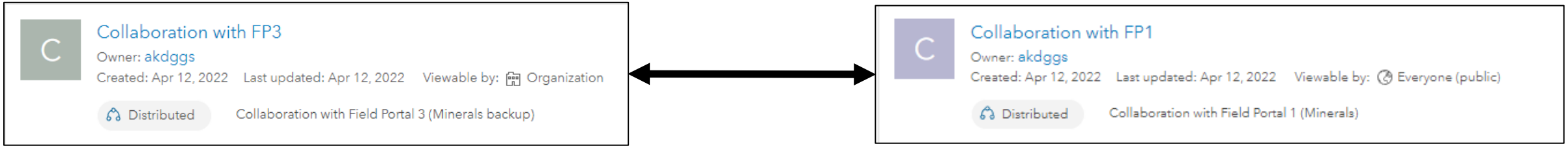
- Ubuntu Server 20.04
- Hostapd for wireless access point hosting
- dnsmasq for DHCP IP addressing
- Samba for file_sharing and field photo backups
- Apache Tomcat web server
- ArcGIS Enterprise 10.8.1 upgraded to 10.9.1

Backup/Recovery through Distributed Collaboration

Distributed collaborations allow ArcGIS Geoportals to share and sync content using groups.

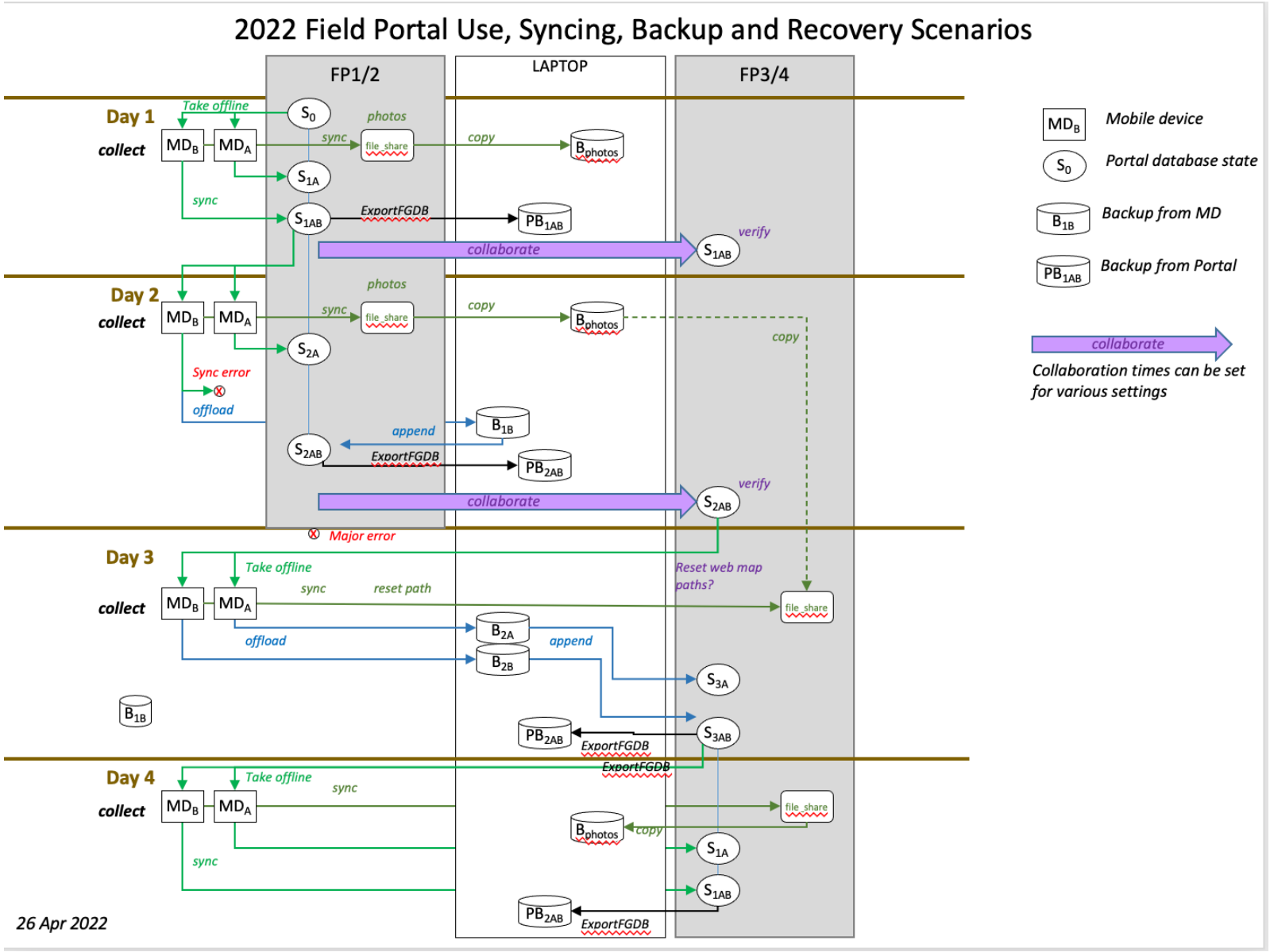
Primary Geoportal (Field Portal 1)

Backup Geoportal (Field Portal 3)



ArcGIS Enterprise 10.9.1 supports two way editing

Stable hardware allows for early and adequate testing!



Hardware Lessons Learned

- **Compatibility with multiple devices of various ages**
  - Supported wireless protocols matters!
  - We designed for 802.11ac, > 866Mbps
  - Some laptops, cell phones, tablets supported only 802.11n

- **Form Factor of M.2 storage**
  - NVMe vs. SATA
- **Missing “pig tails” for wireless antennas**

Looking ahead

- Gather feedback from Geologists post field season
- Continue working on collaborations with DGGS geoportal
- Continue exploring backup and cloning options

Thank you!

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