

AK DGGS' Hardware Solution for Collaborative Field Data Collection

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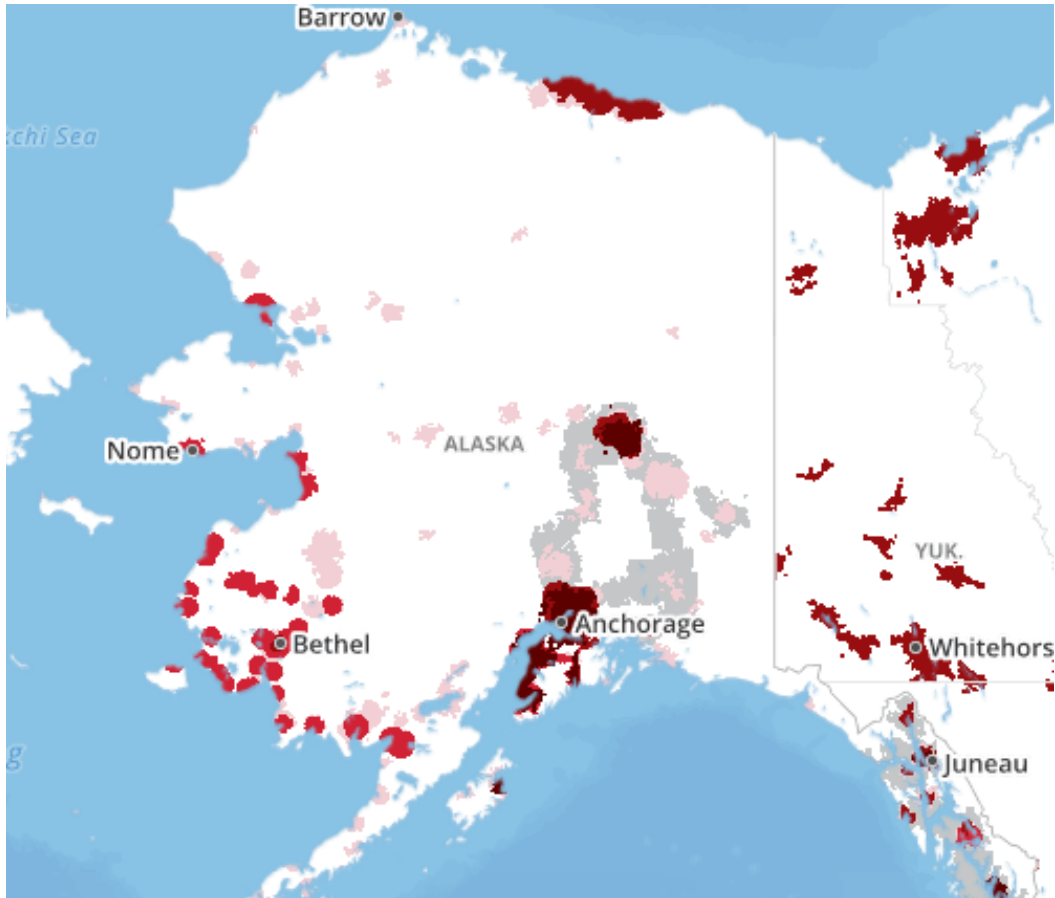
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Collecting Field Data in Alaska



GCI cell phone coverage map from whistleout.com

Data Collectors' Needs:

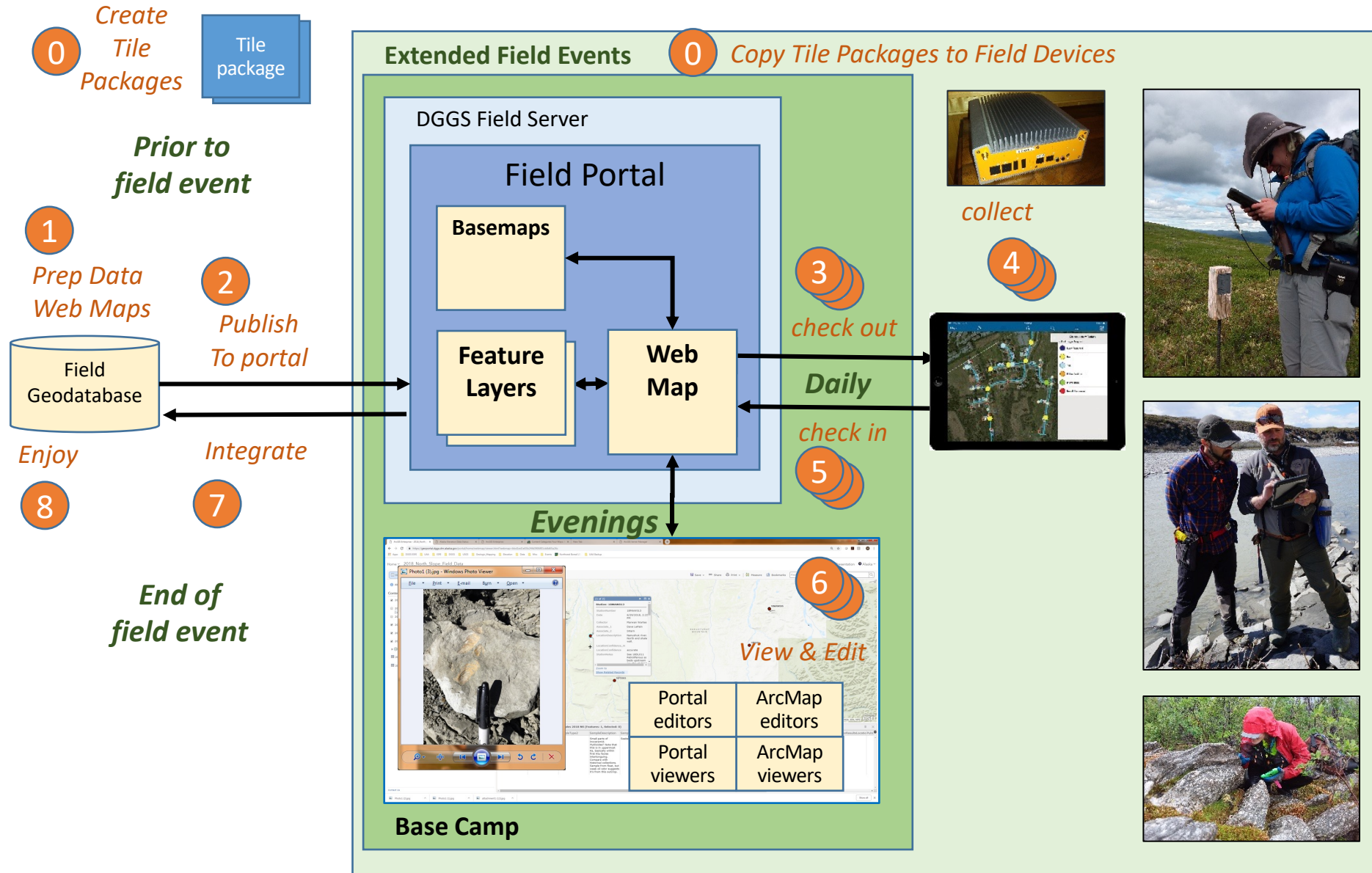
- Online ArcGIS Enterprise geoportal
- Support various handheld wireless devices
- Allow for uploading new data daily
- Allow for sharing data among multiple people



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”

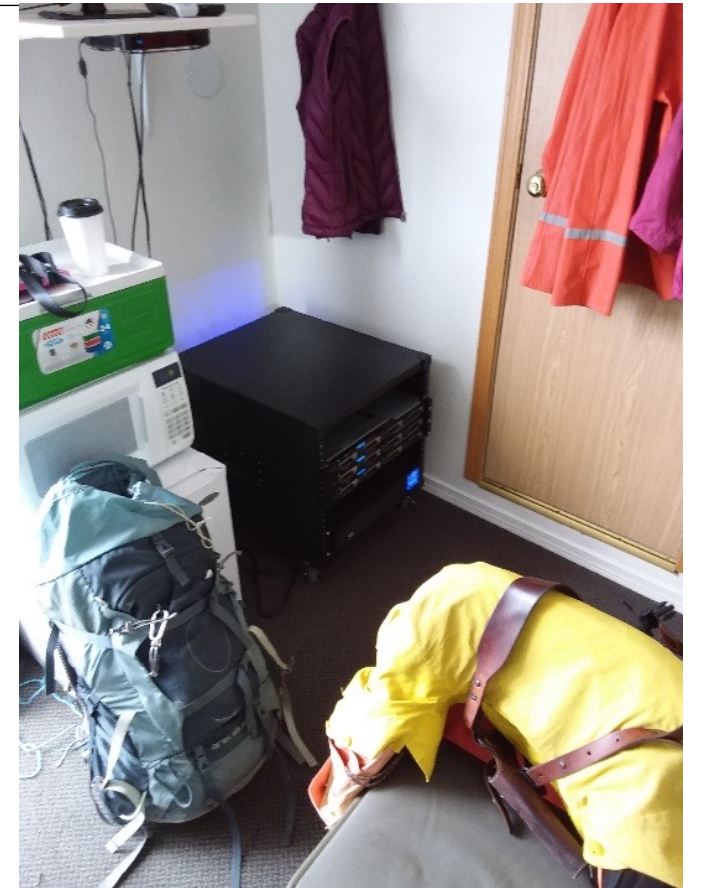
(first iterations)



- 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, 34GB RAM, 1TB disk storage
- Hosts ArcGIS Enterprise (server+portal+datastore)



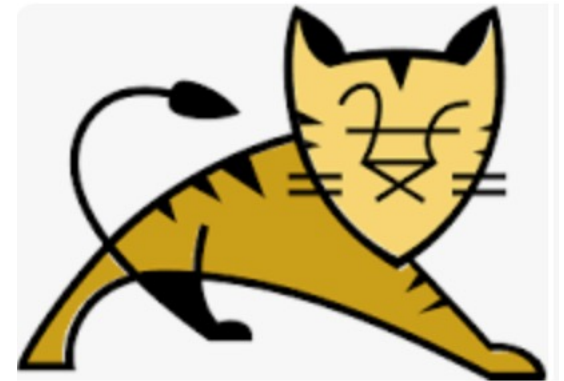
Cool Features

- **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)**



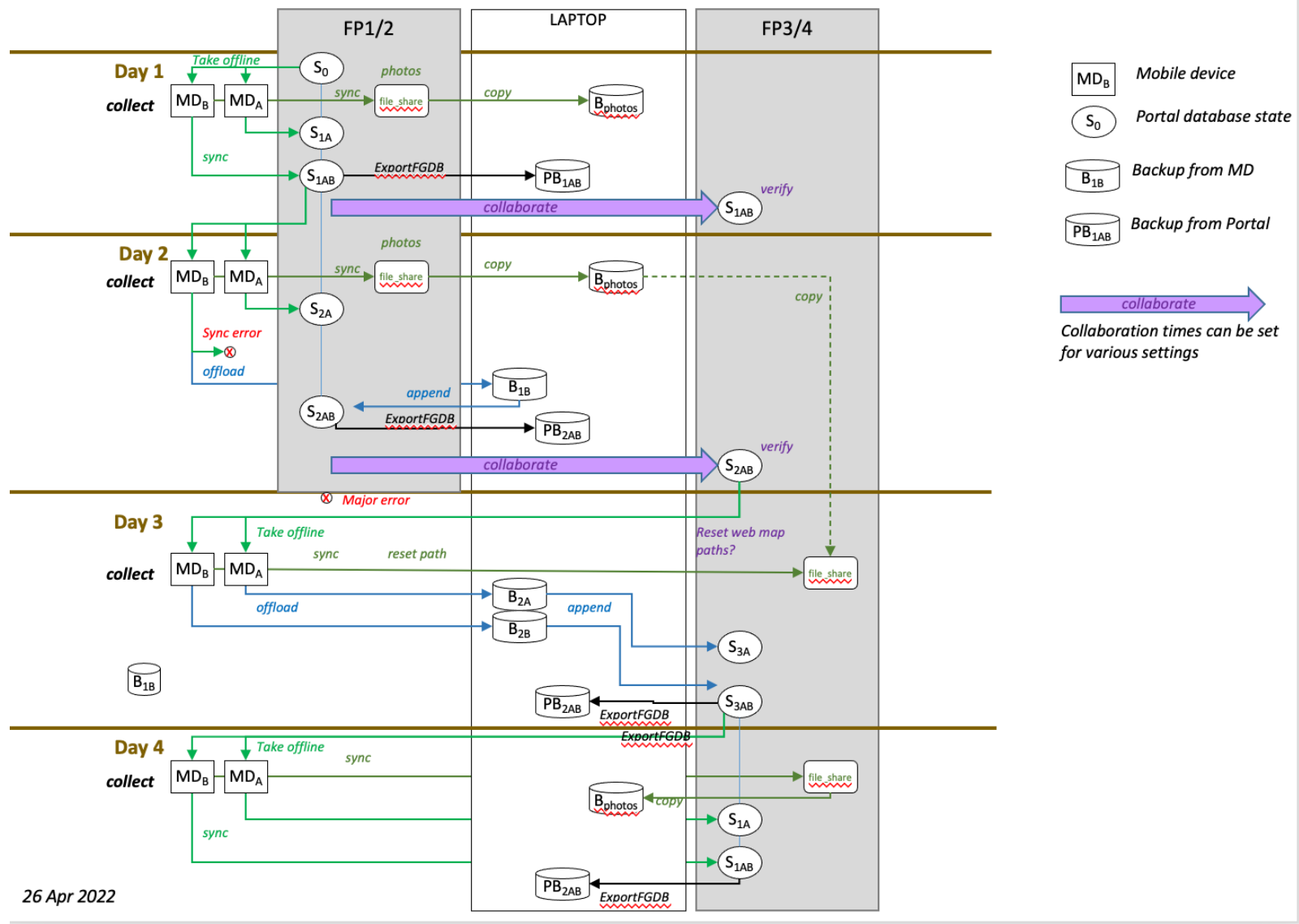
 Collaboration with FP3
Owner: akdggg
Created: Apr 12, 2022 Last updated: Apr 12, 2022 Viewable by:  Organization
 Distributed Collaboration with Field Portal 3 (Minerals backup)



 Collaboration with FP1
Owner: akdggg
Created: Apr 12, 2022 Last updated: Apr 12, 2022 Viewable by:  Everyone (public)
 Distributed Collaboration with Field Portal 1 (Minerals)

ArcGIS Enterprise 10.9.1 supports two way editing

2022 Field Portal Use, Syncing, Backup and Recovery Scenarios

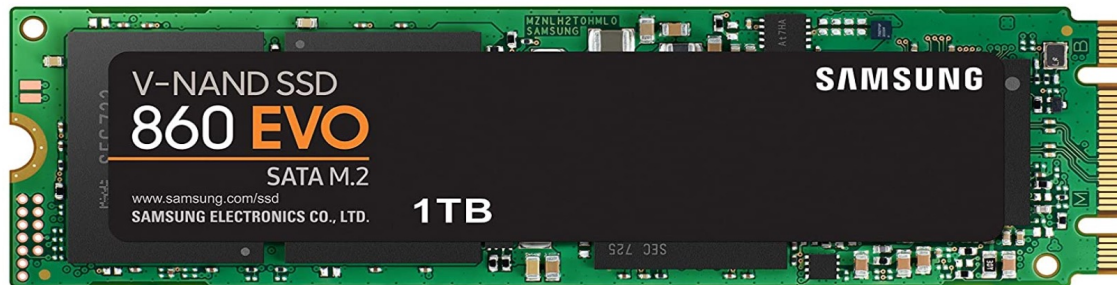


Stable hardware allows for early and adequate testing!

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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