GW-IaaS Online Tests (Mock Data Challenge)

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Online denoising using Deepclean

- Doing low-latency denoising, especially in the low frequency range will improve the SNR for the GW signals such as BNS and provide an earlier alarm for the multi-messenger astronomy (MMA).
Mock Data Challenge: O3b Data

- Git: [Mock Data Challenge](#)
- 2020/01/05 23:59:42 (1262304000) ~ 2020/02/14 23:59:42 (1265760000)
  - without injection: H1:GDS-CALIB_STRAIN_O3REPLAY
  - with injection: H1:GDS-CALIB_STRAIN_INJ_O3REPLAY
Target Noise

- Powerline noise and the side-bands \((60*nHz, n = 1, 2, 3, \ldots)\)
- Low-frequency noise:
  - ASC dither lines \((10Hz \sim 30Hz)\)
  - ASC arm noise \((8Hz \sim 22Hz)\)
- Current task:
  - Offline test on multi-layer cleaning
- Future task:
  - Online test on single noise cleaning or multi-layer cleaning?
Analysis on the Performance

- ASD ratio
- SNR of BNS events (GstLAL)
- Latency
- Comparison of the parameter estimation between cleaned and uncleaned strain.
Deployment during O4: Hardware Solution

- Case: Dell T550 Tower Server
- CPU: Xeon Gold 6326 * 2 (16 cores 2.9GHz) including coolers
- GPU: Dell Nvidia Ampere A30 * 2, PCIe, 165W, 24GB Passive, Double Wide, Full Height GPU with cable
- Storage: HDD 3.5” 8TB * 8 (RAID5) + 960GB NVME SSD * 2
- RAM: DDR4-2933 ECC REG 32GB * 8 (256GB)
- RAID: H745
- Power: 1400W Power Supplies (1+1)
- 1024506 NTD (4467368.66 Yen)