ngCorrelation

Goals:

Scope: R&D program focused on

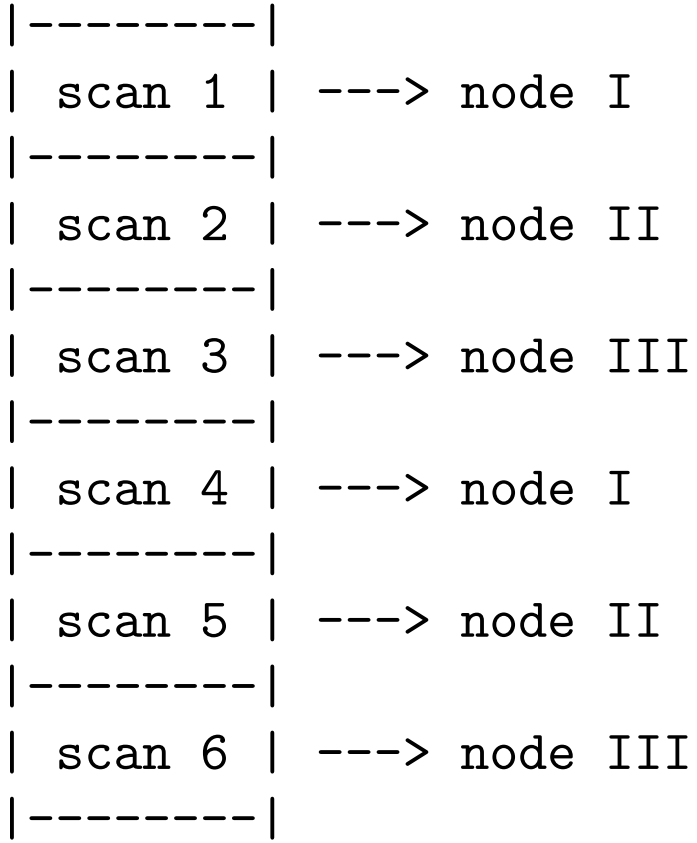
- automation of correlation
- distributed correlation

- Automatic correlation is **already** working for simple cases
- Need to add automatic clock offset search
- Need to add a support of clock break detection
- Need to add a support of bad data diagnostic
- Start with a single baseline experiment, then gradually extend to more than two baselines

Benefits for the agency:

- cost reduction;
- elimination of the bottleneck: availability of the correlator operator
- flexibility in resource allocation

Distributed correlation



Advantages:

- each Node requires N times less bandwidth
- CPU load at each node is reduced by a factor of N

Benefit for the agency: a yield increase of the VLBI array by a factor of N

Partner cloud

Commercial clouds are not suitable because a commercial cloud

- provides a limited bandwidth
- limits CPU utilization
- limits storage

Otherwise, commercial clouds would not make money!

In contrast, a partner cloud is for sharing resources

- does not limit the bandwidth
- does not limit CPU utilization

Partners do not make profit from their computing resources, but just share them.

Analogy: limo service versus car pool

Challenges

- scatter/gather
- synchronization
- security

Approaches:

- utilize DiFX infrastructure for multi-processor interaction implemented via openMPI
- develop a control process

Engagement of partners in Uni Texas in Austin:

- entirely R&D activity for
  - automation
  - distributed correlation
- hardware use: a HPC at Uni Texas in Austin
- students: master and course work
- mentoring: NASA VLBI Lead Scientist + help from partners at Yebes, Wettzell, TU Vienna, Onsala
- internship program for students when they visit NASA