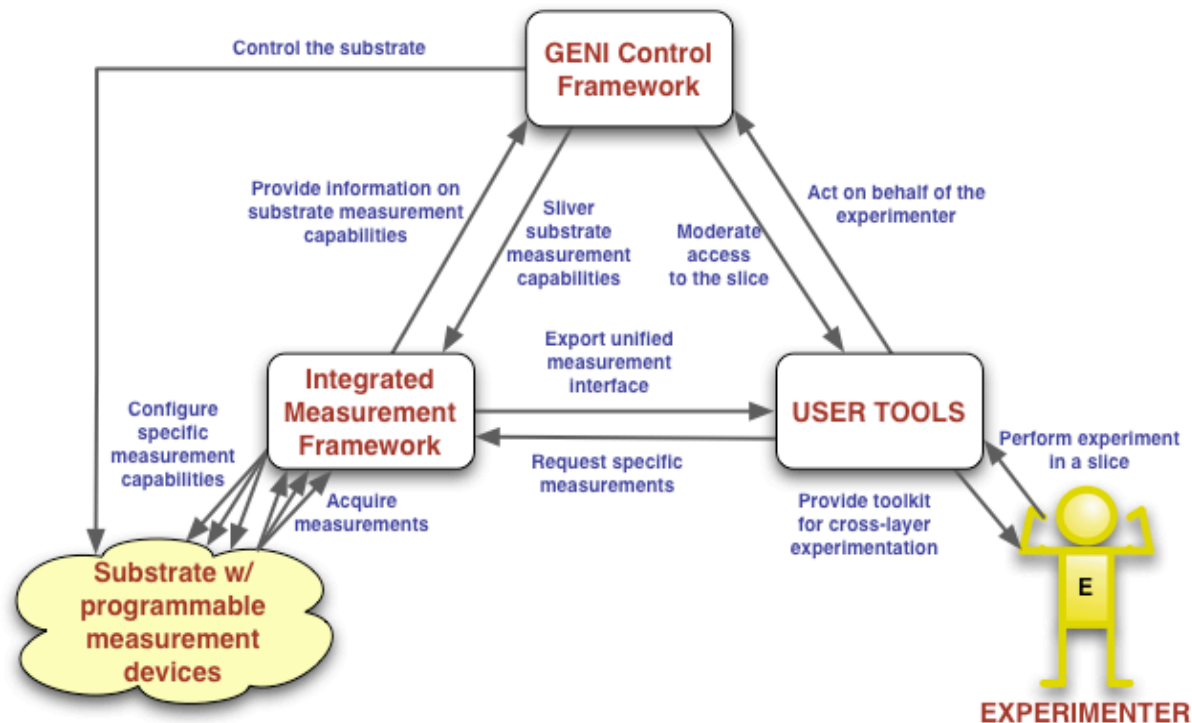


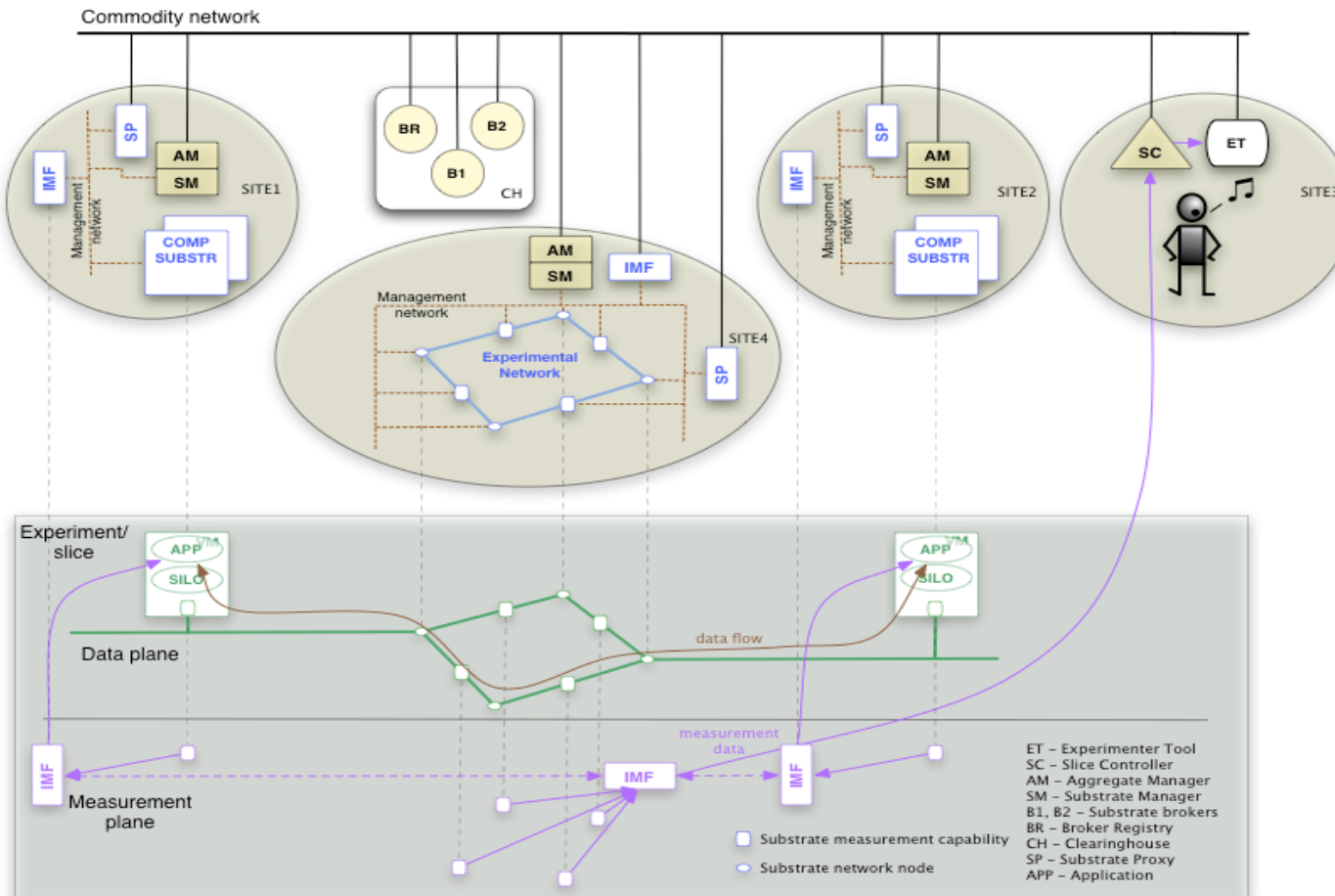


An Integrated Measurement Framework (IMF) for Enabling GENI Substrate Measurement and Control

I. Baldine, K. Bergman, R. Dutta, C. P. Lai, G. Rouskas, A. Wang, M. S. Wang



- Provides abstraction of substrate measurement capabilities
- Physical layer attributes: optical or RF power
- Performance parameters: BER, packet loss, CPU usage
- Experimenter sees unified interface



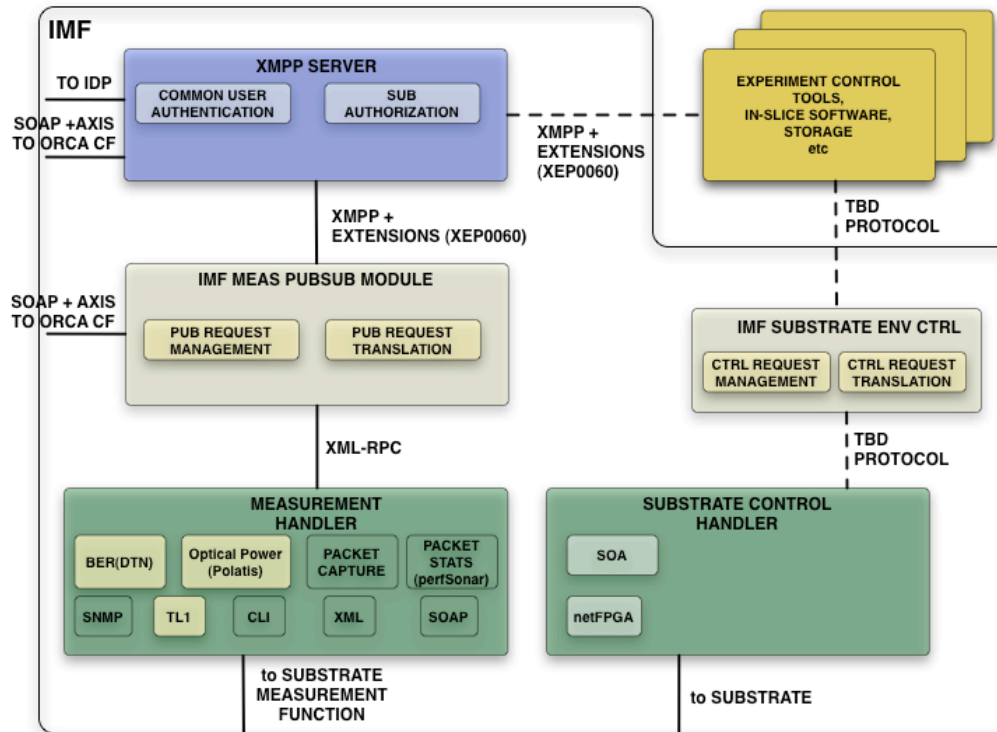
- Measurement plane – represents the measurement functionalities available within an experimenter’s slice
- Substrate environment control – Environment of a slice may be manipulated



Track subscribe requests from consumers;
Receive publish events with measurement data or meta-data.

Allows consumer to subscribe by interest, polls;
Translate information substrate and slice topology.

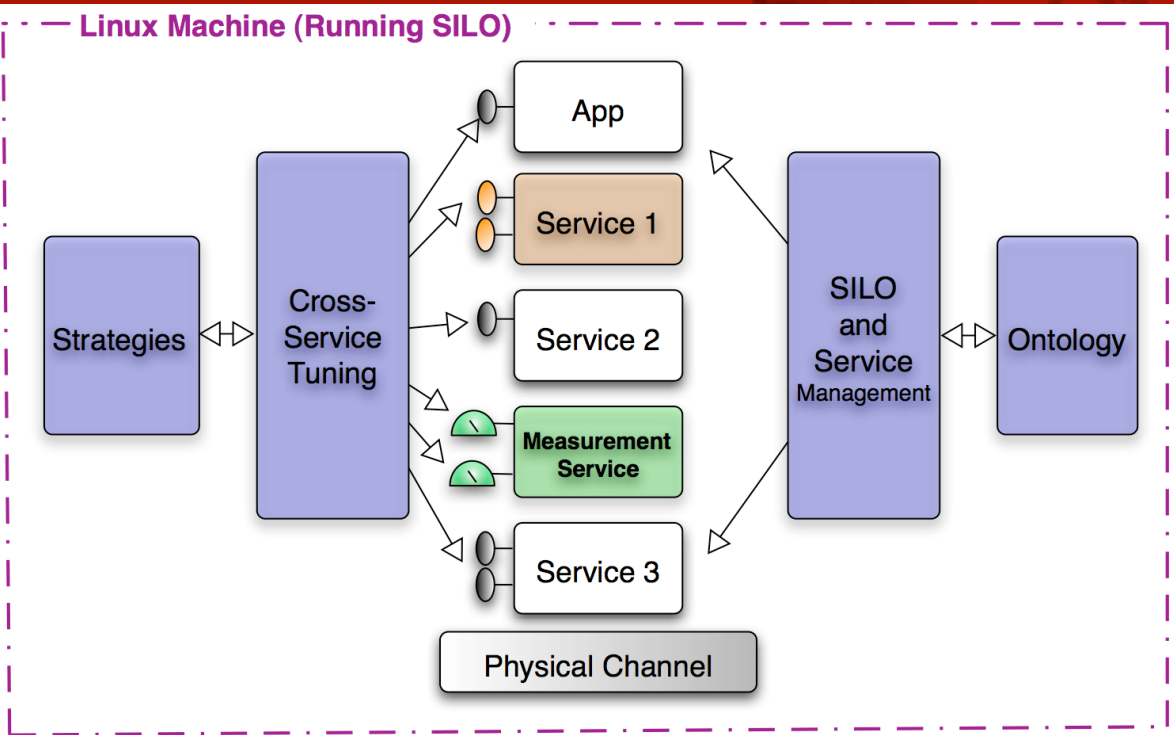
Presents a uniform interface to configure and query substrate measurement capabilities.



Experimenter tools outside slice; In-slice functions for closed feed-back loop; Storage functions to collect and store

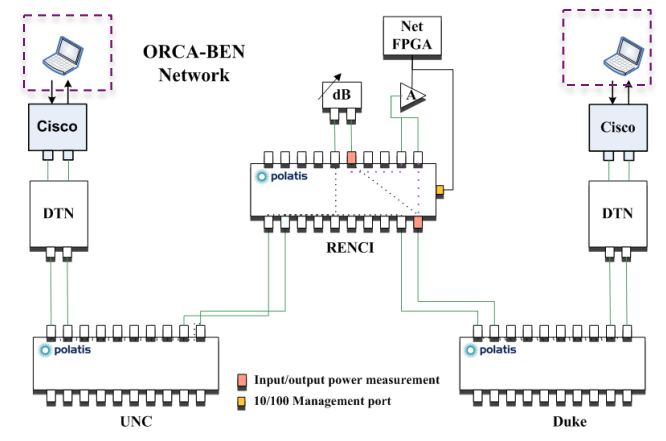
Like PSM, but applied to substrate environment control

Presents a uniform interface to substrate control and manipulation capabilities



Run SILO applications on ORCA-BEN.
SILO: Services Integration, control, and Optimization.

- The SILO Measurement Service can access IMF substrates to obtain measurement data or control substrate environment.
- MH substrates include Polatis, DTN, and Cisco (future).
- SCH substrates may include SOAs, NetFPGAs, programmable attenuators, etc.





- Run SILO – IMF for a complete closed-loop feedback control demonstration
- Create SCM to mirror measurement capability
- Measure – control – monitor
- Down the road – better presenting capabilities to experimenter who only consumes
- Also examine API for in-slice consumer programmers
- Integrate with measurement ontology ?