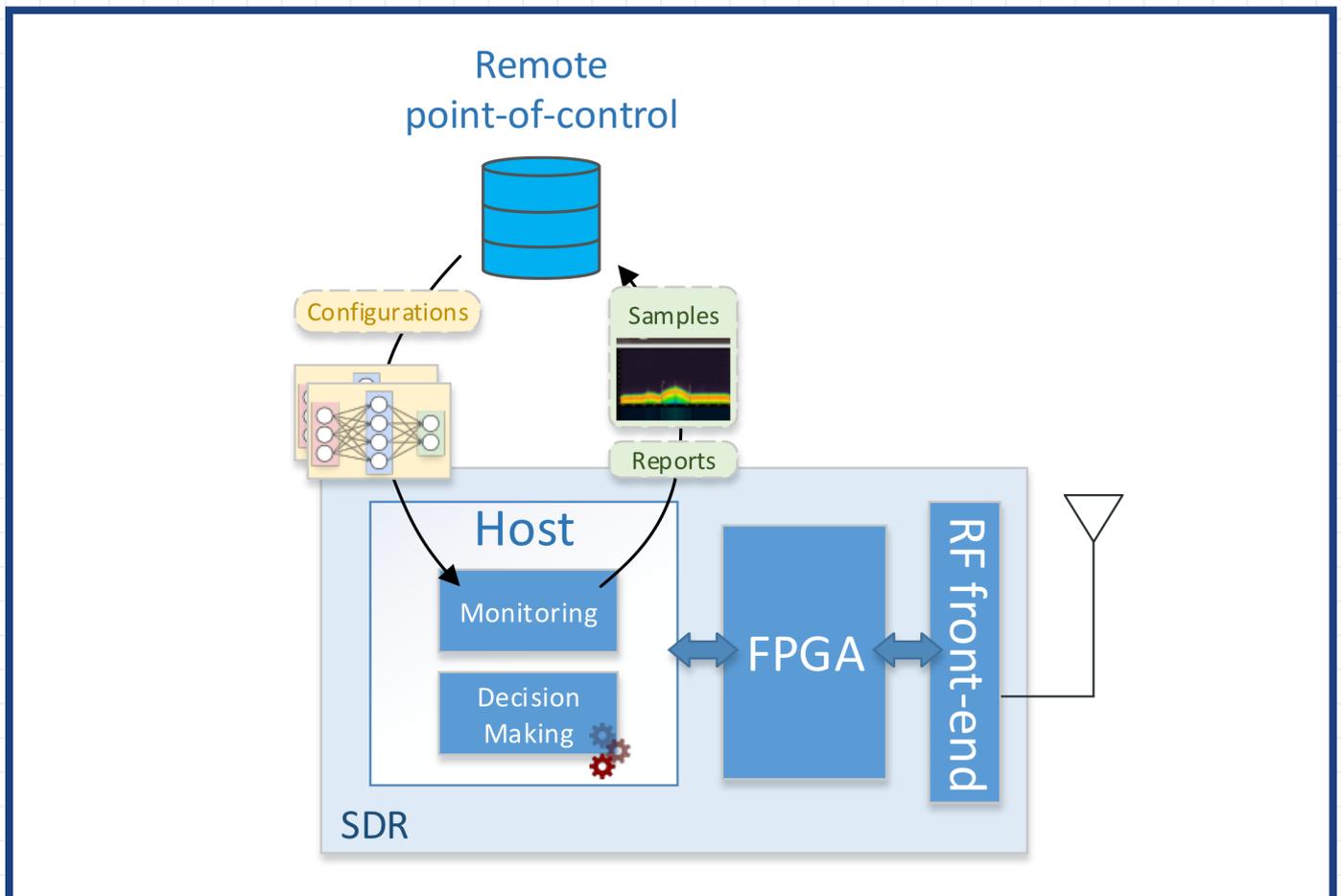


ADVANCED SDR CONTROL AND MANAGEMENT FUNCTIONALITY

Advanced reconfiguration and modular design:
Runtime reconfiguration of monitoring schemes



Framework for remote, runtime control over monitoring schemes for RAT identification and parameter estimation.

- Dynamic instantiation and configuration of monitoring algorithms.
- Uploading raw samples for debugging, enforcement and algorithm training.
- Network-wide awareness of spectrum usage.



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CONTEXT

One of the main challenges faced in the implementation of spectrum monitoring tools is the fact that the types of waveforms and RATs a radio device can encounter in its radio environment may not be known during its design time. Without a software-defined solution, any new RAT standard that gets released and deployed would require a complete re-design and re-deployment of the existing monitoring networks. Another relevant problem is that the required monitoring techniques may change on a frequency, space, time and traffic class basis. To allow radio devices to adapt to new RAT releases, and avoid performing sensing and signal processing tasks beyond what their current context demands, their monitoring algorithms should be dynamically reconfigured from a more centralized point-of-control of the network.

UNIQUE SELLING POINT

In offer 3.2.4, we proposed a framework for training and testing new spectrum monitoring algorithms. Here, we develop the necessary tools for instantiation of monitoring nodes from a remote, point-of-control, and algorithmic reconfiguration at runtime. In addition to this, we provide the mechanisms for collection and forwarding of radio devices' received samples to a centralized database, where these samples can be used for monitoring algorithm retraining and testing.

OPPORTUNITIES

- The set of signal processing techniques utilized by a radio device for monitoring may change dynamically, depending on its context, its traffic class requirements (e.g. low/high power consumption or throughput), or any other unplanned event.
- The reliance on a central point-of-control allow a significant reduction of the costs of deployment of new monitoring solutions in a network.
- Crowdsourcing of radio devices' hardware resources and sharing of collected samples with a database will allow the creation of an extensive dataset of IQ samples of different RAT waveforms for monitoring algorithm design and testing.