Model as a Service

Modern Streaming Data Science with Apache Metron

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Hi, I'm Casey Stella!

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- Better enrichment $\Longrightarrow$ more context $\Longrightarrow$ better insights

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The ideal solution is to enable the mixing of rules, statistical baselining and machine learning.

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  - Share resources fairly by using Yarn for deployment and model lifecycle management

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From there, MaaS will handle deployment, management and model auto-discovery

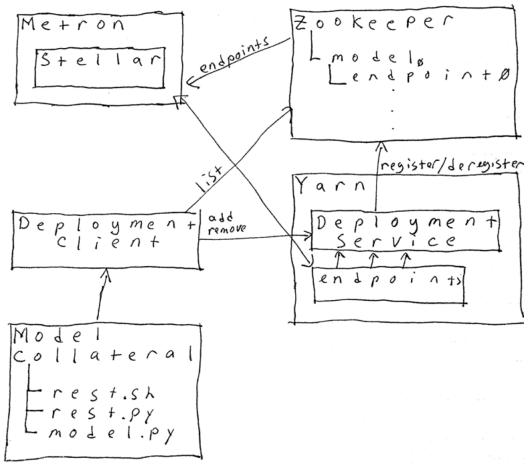
Model as a Service: Stellar

Now that we have a deployment and autodiscovery solution, we need to interact with the models. We think of **Stellar** as like Excel functions that we can run on streaming data:

- Compose a rich set of built-in functions with user defined functions
- Provide simple primitives around the functions: boolean operations, conditionals, numerical computation.

Model interaction is enabled as a set of Stellar functions that discover and interact with model endpoints.

Model as a Service: Architecture



Interlude: Domain Generating Algorithms

Domain Generating Algorithms are used by botnets to communicate with compromised computers in an evasive way. Traffic to a fixed command and control host would be noticed and firewall rules could be modified to cut communication channels cleanly. Instead, the botnet command and control hosts must move around to evade detection. Typically this involves periodically generating a synthetic domain in a repeatable way and having the compromised computers attempt to connect to a few candidate synthetic domains daily with some moderate hope of guessing the right one. This traffic is small enough to be lost in the shuffle of a large organization, making the evasion effective.

Demo

- One solution for detecting synthetic domains is to construct a classifier that must be run against every domain going across the network.
- At the BSides DFW Conference in 2013, ClickSecurity presented a model written in Python for detecting synthetic domains.
- We can expose this model as a REST endpoint, deploy via MaaS and interact with the model via Stellar

```
dga_model_endpoint := MAAS_GET_ENDPOINT('dga')
dga_result_map := MAAS_MODEL_APPLY( dga_model_endpoint
                                  , { 'host' : domain_without_subdomains }
                                  )
dga_result := MAP_GET('is_malicious', dga_result_map)
is_dga := dga_result != null && dga_result == 'dga'
```

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- Automatic conversion of common model output formats to an endpoint
- A searchable model registry

Questions

Thanks for your attention! Don't forget to come to the cybersecurity Bird of a Feather session Thursday.

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