DE LA RECHERCHE À L'INDUSTRIE



PathoTRACK platform on IFB Cloud

IFB Cyclone Hackathon

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IFB-Core - Genoscope/LABGeM

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PathoTRACK project Context

CBRNE Research and Innovation Project

- Partners
 - ► CEA CNS / LABGeM
 - ► CEA CNG / Sequencing Platform
 - ► IFB-Core
 - DGA Maîtrise NRBC
- started since 2015
- ▶ born from CBRNE R&I project named SynBioWatch (2012-2014)













PathoTRACK project Aims

Wet Lab / Sequencing

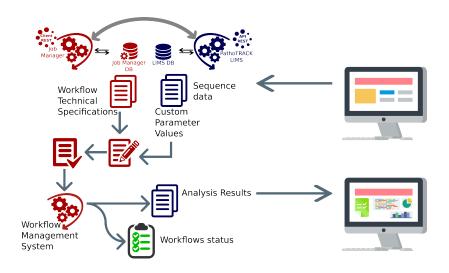
- ► Improve DNA extraction protocol (complex matrix: soil, petrol, ...)
- Benchmarck "portable" sequencing technologies
 - Long reads: Oxford Nanopore Minion, IonTorrent PGM
 - versus
 - Short reads: Illumina MiSeq

BioInformatics

- Quick identification and characterization of pathogens from environmental and clinical samples
- ▶ Develop reference databases (Taxonomique Assignation, ...)
- ▶ Bioinformatic tools integration (SortMeRna, Diamond, Kraken, Centrifuge)
- ▶ Workflow management system: SnakeMake

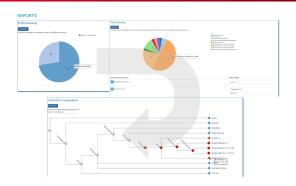


PathoTRACK platform Workflow Management System





PathoTRACK platform Analysis

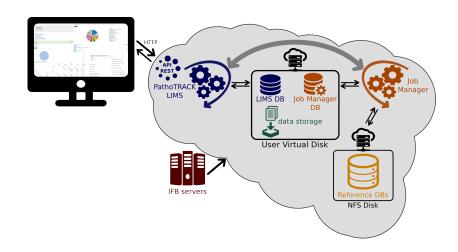


3 workflows

- Preprocessing sequencing data
- Functional annotation (genes involved in drug resistance and virulance)
- Taxonomic assignation



PathoTRACK platform On IFB Cloud





PathoTRACK platform On IFB Cloud

Micro-Services Architecture

- 4 services
 - Web User Interface
 - ► LIMS
 - Workflow Manager
 - MySQL server
- ► Each service is elastic, resilient, composable, minimal, and complete
- ► OS: Linux CentOS 6 (7 in progress) (64 bits)
- ► Can be deployed on Desktop, VM, servers, HPC clusters, Cloud (IFB)
- ▶ Start and stop the platform using a deamon



PathoTRACK platform On IFB Cloud

Installation

- ► The platform is packaged in an archive (tar.gz)
- Bash script (need root privileges)
- Update the system
- Install all needed packages using yum (they will be packaged with the platform to perform an offline installation)
- Install all services of PathoTRACK platform
- Configure the automatic launch of the platform (init.d / chkconfig)
- Configure Apache httpd server in ProxyPass mode (ports redirecting)
- ► Initialize the platform

PathoTRACK platform IFB CYCLONE Hackathon

Use the CYCLONE components to deploy the platform on the new version of IFB cloud

- Use SlipStream to deploy the platform ? each service on a dedicated VM ?
- Configure VM access (Authentication)
- ► Configure a dedicated cluster on IFB Cloud ?



PathoTRACK on IFB Cloud IFB Cyclone Hackathon



Thank for your attention



PathoTRACK platform Development Team

LABGeM

Project Leader: Stephane Cruveiller, Ph D.

- ▶ Johann Beghain
- ► Marine Séjourné

CNG Sequencing platform

- ► Robert Olaso, Ph D.
- Céline Bigot, Ph D.

IFB-Core

► Adrien Josso