ONAP OOF – Casablanca+ Discussion at ONS
03/26/2018, Los Angeles, CA

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Agenda

• Group discussion on Use Case Requirements - 5G, Edge Computing, VOLTE - 20 min.

• Architectural Direction for Casablanca and beyond - 10 min.
  - Evolve to fully Model-driven
  - Interaction with key components A&AI, Multi Cloud, Policy etc.
  - @Scale implementation for large distributed clouds
ONAP Optimization Service Design Framework – Beijing Release

- Optimization Service Design Framework (OSDF)
  - Framework for easily creating model- and policy-driven optimization applications
  - Declarative modeling of models, data templates, and configuration (based on MiniZinc)
  - Lifecycle management (including execution environment) for optimization applications
  - Adaptors to ONAP components (Policy, A&AI, Multi Cloud, etc.); can onboard custom data adapters
  - Support for external optimizers (e.g. supporting HAS) via declarative configuration
  - Building blocks, tutorials, and sand-box containers with demo applications

- HAS use case with vCPE
  - HPA policy integration
  - Integration with Multi Cloud metrics

- Change Management Scheduling Optimization (CMSO)
  - Model driven optimization with Minizinc
  - Demonstration with simulated policies and data
  - Aligned to support the CMSO use case
ONAP Optimization Service Design Framework – Beijing Release (Contd.)

• Stretch goals for R2 (model driven example applications)
  - Model driven implementation of vDNS and vFW use cases
  - Model driven implementation of 5G Load-Aware Placement/Scheduling
  - Notebooks for interactive visualization/analysis and experimenting
  - Visualization and analysis of cloud region utilization
  - Visualization of schedules provided by the CMSO app

• A cloud native containerized app with framework and demo applications
  - Interactive web interface for creating/modifying applications (MiniZinc and various solvers)
  - Visualization interfaces
  - Notebook infrastructure (JupyterLab)
OOF Architectural Direction – Casablanca & Beyond

### Design - Model-Driven Transition

- **Beijing/Casablanca**
  - Map Policy Model (TOSCA) to Optimization (Minizinc) Model

- **Casablanca**
  - Translate Policy Model to Optimization Model

- **Casablanca+**
  - Embed Optimization Model in TOSCA Model

### Deployment/Operation - @scale Edge Cloud Support

- **Multiple solution choices;** Important due to the time lag in @scale infra/application metric collection
- **Joint Constraints** across cloud regions @ease; Important for 5G/Edge Computing Apps
- **Masking Mathematical complexity** of Optimization algorithms through Modelling

- **Infra/Application Aggregate Metrics @scale through DMaaS**
- **Near-real-time solutions for Edge Clouds**

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**Upstream OpenStack, VMware VIO, Wind River Titanium Cloud, Microsoft Azure etc.**
Model-Driven Optimization Framework based on Minizinc

**ONAP-OF Contributions**
- Data Interfaces
- Model/Constraint Translators
- Building Blocks
- Recipes and KnowledgeBase
- Operational Environment

**Available Extensions**
- Contributed Models
- Global Constraint Catalog
- Stochastic Minizinc
  - Uncertainty Considerations
- MiningZinc
  - Constraint-Based Mining
- MiniBrass
  - Soft Constraints

**Current Optimization Technology**
- LibMzn
  - Embeddable Library

**Minizinc Standard Library**
- MiniZinc Model

**Flat Zinc**
- Data (dzn format)

**Integration Tools**
- Gecode
- Google OR Tools
- ECLIPSe
- CHOCO
- Chuffed
- PI CPLEX
- CPLEX
- CoinOR
- Gurobi