SDN Control and Orchestration in FELIX

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eict

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- FELIX is the result of collaboration between European and Japanese Partners, working in unison towards
  - a common system and software architecture
  - large scale testbed federation across two continents

- The project started in April 2013 and will run till March 2016
  - Estimated effort: 302 PMs

SDN Testbed Federation

- Over the last years we have learned a lot about SDN testbed federation as a community
  - OFELIA (www.fp7-ofelia.eu) established the first large-scale OpenFlow-enabled testbeds in Europe
    - users can experiment with new network architectures
  - In Japan, RISE (Research Infrastructure for large-Scale network Experiments) has established an OpenFlow testbed over JGN-X (the largest testbed network in Japan)
    - wide-area coverage from US West coast to Southeast Asia
    - users can experiment and validate their own SDN, cloud, and OF controller solution in the RISE sandbox.
- **FELIX** bridges these two testbed worlds and aims to establish a unique federation on a global scale, using the following key ingredients:
  - OCF, the OFELIA Control Framework, the access and management tool for virtualization and SDN resources. OCF is widely used in Europe and worldwide
  - AMSoil, a solid foundation for building aggregate managers
  - A Clearinghouse, which will implement the FELIX Authentication and Authorization
  - NSI, the Network Services Interface, used for establishing multi-domain on-demand network connection services

The FELIX Architecture for Testbed Federation (1/2)

- **Resource Orchestration**
  - Orchestration of various virtualized resources (compute, network and storage) provided by multiple domains
- **Domain Resource Management**
  - Coordination of various resources provided by heterogeneous resource management systems within a domain
- **Resource Allocation Planning**
  - Consider both computing and network resources, user and resource administrator aspects, such as, for instance, cost, energy consumption and load balancing
- **Provisioning**
  - A virtual flat environment, just like a dedicated cluster, using dynamic resource information, such as IP addresses
- **Authentication and Authorization**
  - All actions are performed (only) by authenticated actors
  - Ensure all actors are who they claim to be; keep track of all authenticated action
- **Monitoring**
  - Information from multiple domains is aggregated and provided to the user.
- **User Access/GUI**
  - Allow for easy interaction between the experimenter and the FELIX testbed federation

- The FELIX Resource Orchestrator is responsible for orchestrating the end-to-end network service and resource reservations for the entire FELIX architecture
  - intra- testbed
  - inter-testbed

AAI: Authentication & Authorization Infrastructure

TN: Transit Network

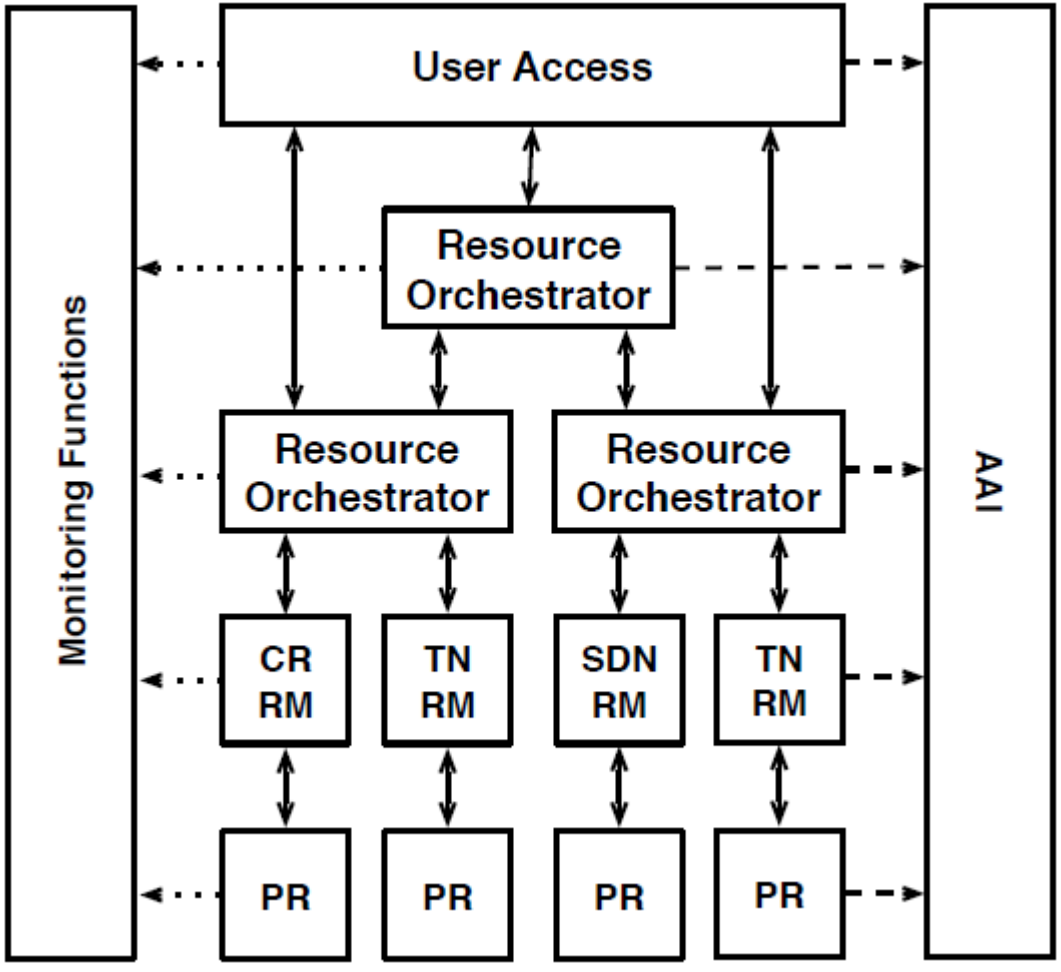
CR: Computing Resource

RM: Resource Manager

PR: Physical Resource

- More details available in Deliverable D2.2

www.ict-felix.eu



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