Building service testbeds on FIRE

Cloud and Network facilities interconnection on BonFIRE

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Outline

• BonFIRE
• BonFIRE architecture
• OCCI Testbeds
• Non-OCCI Testbeds – Federica
• Non-OCCI Testbeds – Autobahn
• Non-OCCI Testbeds - Amazon EC2
• Summary
BonFIRE scenarios and sites

Permanent (>450 cores / 45TB) & On-Request (+1,500 cores) infrastructures

- EPCC (Edinburgh)
- PSNC (Poznan)
- HP (Bristol)
- INRIA (Rennes)
- iMinds (Ghent)
- HLRS (Stuttgart)
- Wellness (Sevilla)

Scenario 1
(normal internet)

Scenario 2
Emulab (Virtual Wall)

Scenario 3
GEANT AutoBAHN and Federica
<compute xmlns="http://api.bonfire-project.eu/doc/schemas/occi">
  <name>my-vm</name>
  <instance_type>lite</instance_type>
  <disk>
    <storage href="/locations/uk-epcc/storages/165"/>
  </disk>
  <nic>
    <network href="/locations/uk-epcc/networks/47"/>
  </nic>
  <location href="/locations/uk-epcc"/>
</compute>
BonFIRE API is OpenNebula OCCI, enhanced.
For OCCI testbeds, Enactor only translates from the global BonFIRE namespace to the specific one of each testbed
OCCI differences

- Minor differences between the OCCI format of each testbed
  - OpenNebula
  - HP Cells
  - Virtual Wall
- E.g. Virtual Wall also offers controlled network functionality
  - Thus, Virtual Wall OCCI includes network metrics

```
<network xmlns="http://api.bonfire-project.eu/doc/schemas/occi">
  <name>KKiMindsNet</name>
  <address>192.168.0.0</address>
  <size>C</size>
  <lossrate>0.2</lossrate>
  <latency>200</latency>
  <bandwidth>700</bandwidth>
  <link href="/locations/be-ibbt" rel="location"/>
</network>
```
• FEDERICA offers isolated network slices by means of virtualizing routers.
  – NOVI has developed SFA interface on top of FEDERICA Web Services.
  – FEDERICA is deploying the NOVI SFA interface.

• SFA Adaptor transforms BonFIRE OCCI to SFA request (RSpec).
  – Multiple OCCI calls merged in one single XML file.

• New router resource added in BonFIRE schema.

• Enhanced network resource with:
  – Network Link
  – VLAN
Non-OCCI - Autobahn

- AutoBAHN offers on-demand network services with guaranteed bandwidth.
  - Currently supported on EPCC and PSNC sites

- AutoBAHN Adaptor translates BonFIRE OCCI to BoD service requests
  - SOAP requests towards the AutoBAHN User Access Point (UAP) interface

- New **site-link** resource added to BonFIRE schema
  - Represents a network service between two BonFIRE sites
  - Specifies the bandwidth constraints
Non-OCCI – Amazon EC2

- Translates the BonFIRE OCCI requests to Amazon EC2 API requests.
- It is able to manage Compute and Storage resources.
- It caches the long storage listings provided by Amazon EC2.
Summary

• BonFIRE supports experimentation and testing of new scenarios from services, systems and applications research community.

• Services delivered under Infrastructure as a Service model.

• BonFIRE demonstrates interconnection and interoperation between Cloud and networking testbeds.

• BonFIRE Enactor plug-in architecture accommodates various testbed interfaces and translates to/from BonFIRE’s native OCCI format.
Thank you for your attention
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