

# Powder Profiles: Packaged Experiment Descriptions

1st Annual Powder Users Workshop

May 24th, 2018

# Motivation

# Motivation for Profiles

- Setting up mobile software stacks is **hard**
- Getting novice users started quickly
- “Scaling” to the world experts in this field
- Provide common, standardized environments to work in
- Share research artifacts to build on

# Using a Profile

# Selecting a Profile

1. Select a Profile

2. Parameterize

3. Finalize

## Selected Profile: OAI-Real-Hardware (Rephash: 05c8dce8)

Use this profile to instantiate an experiment using Open Air Interface to realize an end-to-end SDR-based mobile network. This profile includes the following resources:

Off-the-shelf Nexus 5 UE running Android 4.4.4 KitKat ('rue1')

SDR eNodeB (Intel NUC + USRP B210) running OAI on Ubuntu 16 ('enb1')

All-in-one EPC node (HSS, MME, SPGW) running OAI on Ubuntu 16 ('epc')

A node providing out-of-band ADB access to the UE ('adb-tgt')

PhantomNet startup scripts automatically configure OAI for the specific allocated resources.

For more detailed information:

[Getting Started](#)

Show Profile

Change Profile

Previous

Next

# Profile List

Experiments ▾ Storage ▾
Docs nci1 ▾

## Select a Profile ✕

Recent -

OAI-Real-Hardware	PhantomNet
OneVM	System
parkinglot	System
OnePC-Ubuntu14.04.5	xos
sgx-prebuilt	TCloud

Favorites -

OnePC-Ubuntu14	System
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My Profiles -

parkinglot	System
arm64-ubuntu14	emulab-ops
OnePC-Ubuntu16	emulab-ops
OnePC-Ubuntu-14.04.5-PublicIP	emulab-ops
OnePC-Ubuntu14	emulab-ops
manual-bridge	testbed

### OAI-Real-Hardware ★ Add to Favorites

<b>Created By:</b>	jld
<b>Project:</b>	PhantomNet
<b>Latest Version:</b>	0
<b>Repo Based?:</b>	Yes
<b>Repo Hash:</b>	05c8dce8
<b>Last Updated:</b>	2018-03-06 13:41:29

**Description:** Use this profile to instantiate an experiment using Open Air Interface to realize an end-to-end SDR-based mobile network. This profile includes the following resources:

- Off-the-shelf Nexus 5 UE running Android 4.4.4 KitKat ('rue1')
- SDR eNodeB (Intel NUC + USRP B210) running OAI on Ubuntu 16 ('enb1')
- All-in-one EPC node (HSS, MME, SPGW) running OAI on Ubuntu 16 ('epc')
- A node providing out-of-band ADB access to the UE ('adb-tgt')

PhantomNet startup scripts automatically configure OAI for the specific allocated resources.

For more detailed information:

```

graph TD
    epc[epc] --- db-epc[db-epc]
    db-epc --- rue1[rue1]
    rue1 --- enb1[enb1]
    enb1 --- db-enb1[db-enb1]
    db-enb1 --- adb-tgt[adb-tgt]
            
```

Select Profile
Cancel

# Selecting Parameters

1. Select a Profile

2. Parameterize

3. Finalize

This profile is parameterized; please make your selections below, and then click to continue.

## + Show All Parameter Help

**Experiment type ?**

Over the air

## + Advanced Parameters

**Bind to a specific UE ?****Bind to a specific eNodeB ?**

Previous

Next

# Final Options

1. Select a Profile

2. Parameterize

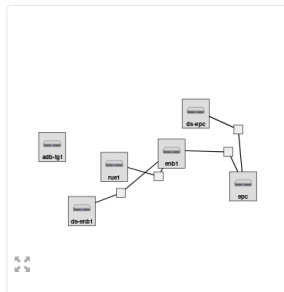
3. Finalize

Profile: OAI-Real-Hardware

Version: 0

Source

Please review the selections below and then click Finish.

Name: Project: 
[+ Advanced Options](#)
[Check Resource Availability](#)


Previous

Finish



# What's in a Profile

# Resource Description

```

134
135 if params.TYPE == "sim":
136     sim_enb = request.RawPC("sim-enb")
137     sim_enb.disk_image = GLOBALS.OAI_SIM_IMG
138     sim_enb.hardware_type = GLOBALS.SIM_HWTYPE
139     sim_enb.addService(rspec.Execute(shell="sh", command=GLOBALS.OAI_CONF_SCRIPT + " -r SIM_ENB"))
140     connectOAI_DS(sim_enb, 1)
141     epclink.addNode(sim_enb)
142 else:
143     # Add a node to act as the ADB target host
144     adb_t = request.RawPC("adb-tgt")
145     adb_t.disk_image = GLOBALS.ADB_IMG
146
147     # Add a NUC enB node.
148     enb1 = request.RawPC("enb1")
149     if params.FIXED_ENB:
150         enb1.component_id = params.FIXED_ENB
151         enb1.hardware_type = GLOBALS.NUC_HWTYPE
152         enb1.disk_image = GLOBALS.OAI_ENB_IMG
153         enb1.Desire("rf-radiated" if params.TYPE == "ota" else "rf-controlled", 1)
154         connectOAI_DS(enb1, 0)
155         enb1.addService(rspec.Execute(shell="sh", command=GLOBALS.OAI_CONF_SCRIPT + " -r ENB"))
156         enb1_rue1_rf = enb1.addInterface("rue1_rf")
157
158     # Add an OTS (Nexus 5) UE
159     rue1 = request.UE("rue1")
160     if params.FIXED_UE:
161         rue1.component_id = params.FIXED_UE

```

# Software Description

```
62 #
63 # Globals
64 #
65 class GLOBALS(object):
66     OAI_DS = "urn:publicid:IDN+emulab.net:phantomnet+ltdataset+oai-develop"
67     OAI_SIM_DS = "urn:publicid:IDN+emulab.net:phantomnet+dataset+PhantomNet:oai"
68     UE_IMG = URN.Image(PN.PNDEFS.PNET_AM, "PhantomNet:ANDROID444-STD")
69     ADB_IMG = URN.Image(PN.PNDEFS.PNET_AM, "PhantomNet:UBUNTU14-64-PNTOOLS")
70     OAI_EPC_IMG = URN.Image(PN.PNDEFS.PNET_AM, "PhantomNet:UBUNTU16-64-OAIEPC")
71     OAI_ENB_IMG = URN.Image(PN.PNDEFS.PNET_AM, "PhantomNet:OAI-Real-Hardware.enb1")
72     OAI_SIM_IMG = URN.Image(PN.PNDEFS.PNET_AM, "PhantomNet:UBUNTU14-64-OAI")
73     OAI_CONF_SCRIPT = "/usr/bin/sudo /local/repository/bin/config_oai.pl"
74     SIM_HWTYPE = "d430"
75     NUC_HWTYPE = "nuc5300"
76     UE_HWTYPE = "nexus5"
77
```

## git Repository

powder-profiles &gt; OAI-Real-Hardware &gt; Details



## OAI-Real-Hardware

OAI profile for running on a Nexus 5 UE and USRP SDR.

★ Unstar

1

🍴 Fork

0

SSH ▾

git@gitlab.flux.utah.edu:powd



Watch ▾

Files (399 KB) Commits (29) Branches (3) Tags (0) Readme

Add Changelog

Add License

Add Contribution guide

Add Kubernetes cluster

Set up CI/CD

master ▾

OAI-Real-Hardware /



History

🔍 Find file

Web IDE



Merge branch 'sim-startup' into 'master' ...  
 Jonathon Duerig authored a month ago

05c8dce8



# Making and Sharing Profiles

# Making Your Own Profile

- Start from an existing one (could be “bare metal”)
- Edit script (or use GUI) to create resource description
- Set up disks the way you'd like, take disk images

# Sharing a Profile

Who can instantiate your profile?

- Anyone*
- Only members of your project

Share

Delete

### Share this Profile ✕

You can share a profile by sending a link to your collaborators. When sharing a *version*, the link refers to the specific version you are sending. When sharing a *profile*, the link always refers to the most recent version of the profile (regardless of when the link is used).

Share this version:

<https://www.cloudlab.us/p/testbed/RStudio-working/1>

Share this profile:

<https://www.cloudlab.us/p/testbed/RStudio-working>

Click on the link to select it

Show/Edit Tour